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The Century Social Science Series

FIELD WORK AND SOCIAL RESEARCH

BY

F. STUART CHAPIN, Ph.D.

PROFESSOR OF ECONOMICS AND SOCIOLOGY, SMITH COLLEGE,
DIRECTOR OF THE SMITH COLLEGE TRAINING
SCHOOL FOR SOCIAL WORK

Author of "An Introduction to the Study of Social Evolution," "An Historical Introduction to Social Economy," etc.

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TO

FRANKLIN HENRY GIDDINGS

Great teacher and pioneer leader in the scientific study of society, whose rare ability to arouse and challenge his student's thought has stimulated the use of scientific method in the study of social phenomena

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PREFACE

A SCIENTIFIC technique has been developed in the field work of the social sciences. Scattered through the reports of private investigating agencies and government commissions there is a vast amount of valuable information on methods of making scientific investigations of social conditions by first hand contact with the facts—that is, by field work. This book gathers together the well tested methods and techniques and attempts to present them in an accurate and practical form. The treatment is not exhaustive, yet it is believed that all of the significant points are touched upon with sufficient detail to make the book useful as a manual to field workers. The theoretical principles underlying scientific method applied to the investigation of social conditions are outlined with sufficient thoroughness to make the book suggestive to students.

The methodology of field work is developed in chronological order as the reader follows the successive chapters of the book. The material is, however, so arranged in chapters and under text headings and by index, that the reader will not have to wade through a mass of descriptive material to find some detail of technique in which he is especially interested.

PREFACE

Actual field work investigations of many different kinds are described in considerable detail and the theoretic principles underlying procedure are so stated that the practice may be critically examined in the light of well-established methods.

F. Stuart Chapin

Northampton, Mass.
May, 1920

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PART I

THE APPROACH TO FIELD WORK

FIELD WORK AND SOCIAL RESEARCH

CHAPTER I

THE PLACE OF FIELD WORK IN SOCIAL RESEARCH

Disinterested examination of contemporary social facts is rare. Only in recent years has the study of social conditions begun to be scientific instead of sentimental. The very complexity of causation which lies back of social problems has often discouraged painstaking analysis and defied systematic investigation. Prejudice and superstition still hamper and frequently prevent an impartial examination of things as they are. Although, as Keller[1] says, "A man can count the legs of a fly and report his findings without having his heart wrung because there are too many or too few," when it comes to social facts, disinterested study is difficult because of the strong emotional coloring of everything that is established and traditional. Controversies about social problems usually give rise to more heat than light.

[1] Keller, A. G.—"Sociology and Science," *The Nation,* vol. 102, No. 2653, p. 475.

SCIENCE IS IMPARTIAL

Scientific study of social conditions is needed to discover truth. The scientific student of contemporary social relations should strive to brush aside these obstacles of emotional bias and objectify the approach to his problem by eliminating self from his judgments. He should provide an argument which is as true for every other mind as for his own.[2] It should be possible for any observer or experimenter to arrive at the same results, provided only that he follows the same method. The classification of data should also be independent of the individual thinker. It is in these things that the element of universality which characterizes modern science resides. It is this all-embracing, this unrestricted adaptability of science which makes it impersonal and almost devoid of individual whim, or bias or prejudice.

THE TASKS OF SCIENCE

Science has three tasks: first, the discovery of the laws of natural phenomena—accomplished by the use of the inductive method; second, the discovery of causes—accomplished by hypothetic inference; and third, the prediction of effects—accomplished by the use of deduction.[3]

Science is judged by its success in the prediction

[2] Pearson, K.—*Grammar of Science*, 2nd Ed. 1892, p. 6.
[3] Peirce, C. S.—"A Theory of Probable Inference," *Studies in Logic*, Johns Hopkins University, 1883.

of effects. In the realm of physical phenomena the laws of matter and motion, the laws of chemical attraction and of combination, have been made the basis of remarkable practical achievements in the applied sciences of engineering and sanitation. On the other hand in the social field its students have signally failed to predict effects. The reason for this seems to be that only recently has the inductive method been used in the study of social phenomena. Semi-philosophical generalizations have been hastily formulated without contact with the facts and from these glittering generalities deductions have been made with scant results. Impatiently turning aside from painstaking accumulation of facts, social "science" has inclined to the "painful elaborations of the obvious."

Says Pearson,[4] "The unity of science consists in its method, not in its materials," and again, "It is not the facts themselves which make science, but the method by which they are dealt with." The striking surface contracts in material—planets, bacteria, beetles, men, mice, elephants, and all the rest—catch our attention and turn it from the central feature of inductive method which is everywhere the same. Whoever uses this inductive method is scientific no matter what material it is that he studies, nor how obscure the corner in which he works.

[4] Pearson, *op. cit.*

THE INDUCTIVE METHOD

The uniform steps of the inductive method of modern science are as follows:

(1) The working hypothesis. The scientist does not go out and make random and haphazard observations of all phenomena. He limits his field by adopting provisionally some hypothesis which will provide a systematic basis for selecting his material. This brings his problem within manageable proportions and saves time. Now hypotheses are often suggested by analogy, and analogies are proverbially dangerous; but the hazards inherent in the analogical method disappear when every hypothesis is subjected to the acid test of facts.

(2) Collection and recording of facts of observation is the second step in inductive method. The approach of the student to his facts should be objective. The effort to be disinterested should eliminate personal bias. There should be method, system, orderliness, in observing social phenomena. Standardization of methods of observation and recording by permitting the comparison of observations of different students made at different times and in different places, contributes to scientific progress.

(3) Classification of the recorded facts of observation into series and sequences throws light on the natural relationships among these facts. This is the third step of the inductive method.

(4) Discovery of some short formula or law to explain the sequence of facts and to express their relationships is the concluding step of the inductive method of science. Deductions from inductive generalizations established in this way form the reliable predictions of science.

In the oldest of sciences—astronomy—the inductive method has been used with remarkable success. The position of a certain planet was carefully observed on a certain day and the result recorded. The observation was repeated at intervals on various subsequent days. When these observations were classified a record of the successive positions occupied by the planet during its course was finally obtained. It remained to discover the formula which explained this phenomena. Kepler discovered that if it is assumed that each planet moves around the sun in an ellipse an explanation is provided which is in precise agreement with the observed facts. Suppose we observe the planet's position on January 1st. Knowing its rate of motion we could calculate the position it would occupy by January 14th by determining how far along the ellipse it would have moved by that date. When January 14th arrived we should find that the calculated position and the position determined by actual observation agreed precisely. Since this test is invariably satisfied, Kepler's formula has been accepted as a scientific law. In other words, it satisfies the test of supplying reliable predictions of future events.

Although great precision still lacks in the field of life sciences, certain laws have been discovered which enable us to predict effects within a certain margin of error. The monk, Gregor Mendel, has given us his law of heredity as a consequence of painstaking experimentation in plant hybridization carried on with the common garden pea. He first determined what characters were constant for certain varieties and species and then proceeded to cross one variety with another. Crossing was accomplished by dusting upon the stigma of one variety, the pollen of a different variety. In every case he discovered that the plant that developed from such a cross exhibited only one of the two contrasting characters of the parent plants. By crossing yellow-seeded and green-seeded plants he obtained in the next generation by self-fertilization, 6,022 yellow seeds and 2,001 green seeds, or about three yellow to one green. Crosses of round- and wrinkled-seeded varieties yielded in the hybrid generation, 5,474 round and 1,850 wrinkled seeds, or again, the ratio of three to one. The hybrids of tall and short parent plants, produced on self-fertilization, 787 tall stemmed plants and 277 short stemmed plants. Mendel found the same proportions held practically constant for other characters. One trait dominated the other in the hybrid generation, and then persisted in the second filial generation in the ratio of three to one. Thus by patient observation and classification of the facts, Mendel discov-

ered a principle of inheritance. His explanation, or theory, held that the reason for the splitting of pure dominants and pure recessives from hybrid parents must be found in the composition of the male and female sex cells. If it is assumed that the germ cells are pure with reference to the constant character observed in the original generation, then the hybrids possess germ cells half of which are pure for one character and half for the other, and it follows that self-fertilization in this generation will produce, on the average, three plants showing the dominant character to one with the recessive. Since this explanation agrees with the facts and, within the margin set by the law of averages, enables us to predict the consequences of crossings of known contrasting traits, a scientific law of heredity of living things has been formulated. There is considerable evidence to show that in man[5] such characters as short fingers and toes (brachydactyly), webbed fingers and toes (syndactyly), and supernumerary digits (polydactyly) are dominant over the normal condition, and that in the nervous system, hereditary feeble-mindedness, hereditary hysteria, hereditary epilepsy and so on, are recessive to the normal. In so far as studies of this sort are substantiated by additional evidence, the enormous importance of Mendel's law for the control of human welfare becomes evident.

[5] Conklin, E. G.—"The Phenomena of Inheritance," *The Popular Science Monthly*, vol. 84, no. 22, pp. 440–441.

The German statistician Ernst Engel, gathered together data showing the expenditure of Saxon working-class families. He classified these figures as expenditure for food, rent, fuel and light, clothing and sundries. Study of this data led him to formulate the following inductive generalizations: first, the greater the income, the smaller the percentage outlay for subsistence; second, the percentage outlay for clothing is approximately the same, whatever the income; third, the percentage for lodging or rent and for fuel and lighting, is invariably the same, whatever the income; and fourth, as income increases in amount, the percentage of outlay for sundries becomes greater. Students of family budgets and the standard of living in America have confirmed the first and fourth of his conclusions; but the second does not hold good, since expenditures for clothing usually rise with increase in income; while the third is only partially true, for the percentage of rent varies only slightly as income rises, that for light even less, and expenditure for fuel actually falls. Conditions making for greater elasticity and freedom in expenditure of American families probably explain this disagreement. Recently Ogburn has given mathematical-statistical expression to these principles of income and expenditure thus stating them in precise quantitative terms.[6] Although Engel's "laws of in-

[6] Ogburn, W. F.—in *Quarterly Pub. Amer. Statistical Assoc.*, vol. 16, no. 126, June 1919, p. 374.

come'' are not yet admitted to the rank of scientific laws, considerable progress in that direction has been made and the validity of the inductive method has been established in one of the most perplexing corners of the social-economic field.

Observation of natural phenomena under conditions of control has been the secret of the success of physical science. The experimental method is a tool of extraordinary efficiency. But the experimental method is extremely difficult of application to social phenomena.[7] The number and interplay of factors in any social problem make it almost impossible to determine all of the agents that are at work, and until the factors can be defined it is not possible to control all conditions save the one to be measured—and yet this is the *sine qua non* of the experimental method. Progress in social science is therefore hampered by the difficulty of making observations under conditions of control, and this fact explains in considerable measure its slow development as compared with the brilliant achievements of physical science.

FIELD WORK AND THE INDUCTIVE METHOD

Although it is difficult to isolate one factor at a time in the study of social phenomena, there is no excuse for failure to make direct observations of social facts. Now it is just at this point in social

[7] Chapin, F. S.—"The Experimental Method and Sociology," *Pop. Sci. Mo.*, vol. 4, nos. 2 and 3, 1917.

LOT CARD

STREET NO. WARD BLOCK DATE

BUILDING
Front-Rear-Brick-Frame Det.-Semi Det.-Row STYS. No.-Cel.-Bas. S. F.-2F.-C.H.-T.H. NEW. 5 YRS. OLD. APTS. PER FL'R C.-B.-1-2-3-4-5-6 REPAIR G.-F.-B.

STORES
None-No. LOCATION KIND NUISANCE

LOT
Width Depth % Occupied by Bldgs. % Occupied by Out-Bldgs.

OWNER OR AGENT
NAME ADDRESS

Agent
NAME ADDRESS

STREET
How Paved REPAIR G.-F.-B.

SEWER
Yes-Not

CITY WATER
Yes-Not

FIRE ESCAPES
None-Adqte. LOCATION St.-Yard-Court Repair G.-F.-B. OBSTRUCTED Dangerous EGRESS FROM YARD Adqte.

GARBAGE CANS
Adqte.-No.-Metal-Wood WHERE KEPT WHEN EMPTIED NUISANCE

ASH CANS
Adqte.-No.-Metal-Wood WHERE KEPT WHEN EMPTIED

YARD
None-Size in ft. Drainage Sewer-Surface-Adqte.-Swampy-Water RUBBISH Fr.-S.-M.-Nu. WEEDS None-Many GARDEN Yes-None

YARD TOILET STRUCTURES
No. Toilets No. Fam. None REPAIR G.-F.-B. CLEAN C.-D.-FL.-Nu. NO. FT. FROM HOUSE PRIVACY Door Lock NO. COMPTS. NO. SEATS NO. FAM. USING

HALL AND APARTMENT TOILETS
No. Per Floor Kind Material LOCATION Apt.-Hall Enclosed Trapped Flush Court or Shaft Size

VAULT
CESSPOOL RAIN LEADER
SEWER-CONNECTED MATERIAL HOW FULL Less than Half-Full Overfull FIXTURES FROZEN Yes-None Repair G.-F.-B. Discharges Where

OUT-BUILDINGS
None-Frame-Brick USE Storage-Stables-Chickens-Others CLEAN C.-D.-FL.-Nu. REPAIR G.-F.-B.

WATER SUPPLY
Street-Yard-Cellar-Halls-Apts. SOURCE Hydrant-Pump KIND City-Well ADQTE.

LOWEST FLOOR
Cel.-Bas. USE Business-Storage-Dwelling VENTILATION G.-F.-B. LIGHT L.-GL.-D. DAMPNESS Dry-Wet-Water

HOUSE DRAIN
VERTICAL PIPES
Exposed-Iron-Earthen-Free-Obstructed-Holes SOIL Exposed-Holes WASTE Exposed-Holes

ROOF
STAIRWAYS
ACCESS None-Scuttle Bulkhead-Locked Stairs-Ladder-Detached-Obstructed REPAIR Tight-Leaking FLAT PITCH MATERIAL Front-Back

PIPES ABOVE ROOF
ASSESSED FOR $
VENT SOIL WASTE

Figure 1—Lot Card used in housing investigation.

STREET NO. TOWN DATE

BUILDING
Front-Rear-Brick-Frame Det.-Semi Det.-Row STYS. No.-Cel.-Bas. S. F.-2 F.-C. H.-T H. NEW-LAW-OLD-LAW APTS. PER FL'R C.-B.-1-2-3-4-5-6 REPAIR G.-F.-B.

STORES
None-No. LOCATION KIND NUISANCE

LOT
Width Depth Space bet. Bldgs. & Side Lot Lines Depth of Bldg.

OWNER
NAME ADDRESS

AGENT
NAME ADDRESS

STREET
How Paved REPAIR G.-F.-B. CLEAN C.-D.-Fl.

SEWER
Yes-Not

CITY WATER
Yes-Not

OUTSIDE STAIRS
None-Fire-Escape-Adqte. LOCATION St.-Yard-Court Repair G.-F.-B. OBSTRUCTED Dangerous EGRESS FROM YARD Adqte.-Obstructed

GARBAGE CANS
Adqte.-Tight-Cover-Standard-Metal-Wood WHEN EMPTIED NUISANCE

ASH CANS
Adqte.-Tight-Standard-Metal-Wood WHEN EMPTIED

YARD
None-Size in ft.-How Paved-Repair G.-F.-B DRAINAGE Sewer-Surface Adqte.-Swampy-Water RUBBISH Fr.-S.-M.-Nu. GARDEN Yes-None

OUT BUILDINGS
None-Frame-Brick USE Storage Horses-Cows-Chickens-Rabbits CLEAN C.-D.-Fl.-Nu. REPAIR G.-F.-B. % of Yard Occupied by Out-Buildings

YARD TOILET STRUCTURES
None REPAIR G.-F.-B. CLEAN C.-D.-Fl.-Nu. NO. FT. FROM HOUSE PRIVACY Door lock NO. COMPTS. NO. SEATS NO. FAM. USING

VAULT
SEWER-CONNECTED MATERIAL HOW FULL Less than Half-Full-Overfull-Flows Over Yd FIXTURES FROZEN

CESSPOOL
Yes-None

HALL, CELLAR AND APT. TOILETS
No. per Floor Kind Material LOCATION Apt.-Hall-Cellar Enclosed Trapped Flush CLEAN C.-D.-Fl. REPAIR G.-F.-B.

WATER SUPPLY
Street-Yard-Cellar-Halls-Apts. KIND City-Well ADQTE.

SINK
Hall-Apt. Enclosed-Trapped REPAIR G.-F. B.

LOWEST FLOOR
Cel.-Bas.-Air Space h't above ground USE Business-Storage-Dwelling VENTILATION G.-F.-B. LIGHT L.-Gl.-D. DAMPNESS Dry-Damp-Wet-Water

HOUSE DRAIN
Exposed-Iron-Earthen-Free-Obstructed-Holes

VERTICAL PIPES
SOIL Exposed-Holes WASTE Exposed-Holes

RAIN LEADER
Repair G.-F.-B. Discharges Where

ROOF
ACCESS None-Scuttle-Bulkhead Locked Stairs-Ladder-Detached-Obstructed REPAIR Tight-Leaking FLAT PITCH MATERIAL

STAIRWAYS
Front-Back

HALLS
Skylight-Windowless-Gl.-L

WINDOWLESS ROOMS
None-Bas.-Cel.-1-2-3-4-5

NO. ROOMS WITH WINDOWS OPEN ONLY TO
Hall-Another Room

Hudson County, N. J.—Form 1—'12—House Card—National Housing Association.

Figure 2—Lot Card used in housing investigation.

research that field work supplies the technique for observing social phenomena by first hand contact in the field. Field work is the technique of studying social conditions by first hand or direct contact with the facts. Systematic field work supplies the means for approaching the study of social phenomena in an objective way. By the use of carefully prepared schedules the personal equation of the field worker is minimized and comparable observations are obtained. The chief mechanical tool of field work is thus *the schedule.* In so far as the plan and arrangement of inquiries on the schedule objectify the study of social conditions by supplying the basis for quantitative expression of qualitative facts, the schedule is an instrument of scientific observation. In this sense the schedule is the analogue in social science of the telescope, the camera or the spectroscope in the science of astronomy. These latter instruments of observation extend the power of the human senses and permit the recording of observations in an objective fashion. As we shall see in chapter vii, the schedule used in field work performs the same function in a limited way. Systematic field work, methodical observation of social facts, requires careful organization of the investigation. In the following chapters we shall describe and illustrate the different methods of planning the field work of investigation, involving the principles guiding the selection and instruction of the field staff, the preparation and use of

schedules, the supervision of workers in the field, and finally, the editing of schedules turned in by field workers.

Field work however well-planned is not the first step in the scientific investigation of social conditions. It must be remembered that field work is the technique of making direct observations by first hand contact with the facts. Suppose some one else has gathered the data required by the investigation? Before plunging into field work therefore, it is necessary to survey the subject of investigation to discover whether some one else had not already gathered the necessary data. This means that documentary records or written descriptions and reports of former studies should be consulted *before* planning or starting the field work phase of the investigation. It is commonly supposed that the scientific chemist spends most of his time experimenting in the laboratory. This is not the case, for three-quarters of his time in any research work is devoted to reading at the library all the literature on the particular subject he is investigating. In reality, only one-quarter of his time is put in at the laboratory in actual chemical experimentation. Similarly the social scientist before he begins field work should thoroughly survey the field to discover what has already been done. Thus indirect observation precedes direct observation. Since the systematic use of documentary sources is a subject in itself and one in which a real scientific technique has

been built up by historians, we shall treat of it in some detail in chapter ii.

A clear undestanding of the place of field work in scientific method applied to the study of social conditions is necessary if we are to orient ourselves properly with reference to this specialized branch of social investigation. We have, therefore, considered field work in the light of the three steps of the inductive method and found that field work, being a technique of directly observing social facts, corresponds to the second step of the inductive method, e.g., that of collecting and recording the observations of natural phenomena. But we have discovered that a survey of documentary records of observations previously made comes first, and is only followed by field work when it is certain that existing records are incomplete. It is thus clear that field work and the historical method (critical use of documentary sources) are the two specialized techniques of social science for collecting and recording the observations of social phenomena.

FIELD WORK IN SOCIAL RESEARCH

While we are considering this matter it is interesting to inquire whether in social science there has been developed any method or technique corresponding to the third and leading up to the fourth step of the inductive method? The statistical method does in fact furnish a highly efficient tool for scientific classification (tabulation) of

social data and for the interpretation (graphic methods, ratios, averages, index numbers, correlation, etc.) of social and mass phenomena. It is the statistical method, therefore, which supplies social science with a special technique for classifying and interpreting social data. The place of field work in the procedure of social research is thus intermediate between the application of the historical method and the statistical method. If we should attempt to enumerate the methods of social research, we should find that there are three distinct methods, each with a highly developed technique all its own: (1) the historical method (developed by historical students); (2) field work (developed by statisticians and social workers); and (3) the statistical method (developed by statisticians and mathematicians).

The inductive method	*Methods of social research*
1. The working hypothesis.	
2. Collection and recording of facts of observation.	1. The historical method of critically using documentary sources. (indirect observation) 2. Field work. Observation by first hand contact with the facts. (direct observation) a. Case work b. Sampling c. Complete enumeration.
3. Classification of the facts of observation into series and sequences for comparison.	3. The statistical method a. Tabulation
4. Generalization from these classified facts to some short formula or law which explains their relations.	b. Graphs, ratios, averages, indexes, correlation coefficients, etc.

The above tabular arrangement may serve to clarify the relations of the different methods of social research as they form special phases of the inductive method in social science.

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CHAPTER II

CRITICAL EXAMINATION OF DOCUMENTARY SOURCES PRECEDES GOOD FIELD WORK

The first step in making any investigation is to discover what others have done in the same field. This means careful examination of documentary sources and written records to be found in libraries. It is short-sighted and wasteful of time to plunge at once into field work.

THE SCEPTICAL ATTITUDE TOWARD DOCUMENTS

In the use of all documentary sources there is a fundamental need of scepticism. The investigator has a spontaneous tendency to yield assent to affirmations made in documents and to reproduce them without distinguishing them from the results of his own observations.[8] Since credulity is natural and deeply rooted in human indolence there is need of criticism of documentary sources. It is far easier to admit a statement than to criticize it; it is much simpler to believe than to discuss; and less difficult to accumulate evidence, documentary statements, facts and quotations, than to weigh them.

[8] Langlois, C. V., and Seignobos, C.—*Introduction to the Study of History* (G. G. Berry translation) 1912, p. 69.

Every student of social conditions should try to overcome his intellectual inertia. He should train himself not to accept indiscriminately, and without any attempt to verify, hearsay reports, anonymous statements, and documents of doubtful authority. By dint of continued and conscientious practice he should form the habit of criticism.

It must always be remembered that documents supply indirect, as contrasted with direct knowledge. Documents are the records of the thoughts and actions of other men in a recent or a remote past. They are merely traces of psychological operations once performed. Now events are known to us in two ways only: (1) by direct observation while they are in progress (this is the sphere of field work); (2) or indirectly, by the study of traces which they have left behind them. The document is thus the record of an observation. In using documentary reports of events or descriptions of conditions, we do not observe ourselves but draw inferences from the observations of others. The documentary source is therefore, merely the starting point, with the fact as the goal. Field work, on the contrary, begins with first hand observations of the facts.

THE HISTORICAL METHOD

Historians have developed a scientific technique for the critical use of documentary sources. Although some phases of the *historical method* are

too specialized to be of service in the ordinary social investigation, the larger part of the historical method is of direct applicability to the problems with which the student of social research deals. Indeed, the historical method is one of the three important methods of social research, the others being, field work and the statistical method. Now the main divisions of the historical method are two:[9] (1) external criticism of the objective characteristics of the document, including critical examination of authorship, critical classification of sources, and criticism of the form or text of the document; (2) internal criticism of the subjective characteristics of the document, involving a consideration of the real meaning of the author's statements, his good faith and accuracy.

EXTERNAL CRITICISM

The form and appearance of the document as distinguished from its contents should first receive our critical attention. Here again, we must be on our guard against the spontaneous tendency of the human mind to place confidence in the indications of authorship. The "impulse of confiding trust" must be checked. We should obtain satisfactory answers to such questions as: where and when did the document originate? Who was the author? What were the sources used?

To be really critical, a classification of sources

[9] *Ibid.*, pp. 66–69.

should show discriminate selection of material and absence of credulity. Compiling a critical bibliography is one of the first things to do in starting an investigation. There are different methods of classifying documentary sources. Certain methods should not be followed, for example: do not make notes on documents read or consulted and enter them in a notebook one after another in the order studied, because such a procedure defeats classification; do not enter notes in a book under headings which form a prearranged scheme, for such a procedure leads to a system of classification that is too rigid; it is still worse to rely on memory and fail to make notes at all. The best plan, on the whole, is to make loose leaf notes as the examination of documents proceeds. All slips or cards should be of uniform size with a heading upon each to identify the subject of its contents, and a full citation to source at the bottom. Slips or cards prepared in this way may be filed, classified and cross-indexed for ready reference. References to sources should follow consistently one of the standardized methods of footnote citation. Author, title, date of publication, number of edition, volume, part, chapter and page, should be given to properly indentify the precise source. It is only in this way that your findings are convincing to other minds, for others may then check up your evidence.

Historians have developed certain principles to test the relative value of documentary evidence

when, (1) the original document is preserved, (2) when a single copy only is preserved, and (3) when several copies are preserved and errors must be compared. These principles are too specialized to discuss here, but in general it may be said that the document of original entry is more reliable than the copy or derivative. It should also be remembered that errors in the original document survive in the copy.

Criticism of the external characteristics of documents, outlined in the preceding paragraphs, has its limitations and its dangers.[10] The votaries of critical scholarship are as much in error in unduly exalting the merits of criticism as are superficial and sentimental persons who hold critical scholarship in contempt. It should be remembered that criticism of the externals of a document is *merely preparatory* to the more difficult and important task of criticizing the psychological aspects of the source. External criticism is thus a means to an end, and not an end in itself. While critical analysis into the minutiae of documents satisfies the impulses towards collecting and puzzle-solving, it sacrifices the higher faculties to purely critical learning. There is danger that the pursuit of this branch of criticism will lead to dilettantism and to hypercriticism. The technique of criticism tends to become more important than the results. The tool becomes the goal. Criticism comes to exist for the sake of

[10] *Ibid.*, pp. 114–134.

criticism. The result is loss of power to work. "Some of the most accomplished critics merely make a trade of their skill, and have never reflected on the ends to which their art is the means." [11]

INTERNAL CRITICISM

Internal criticism of the subjective characteristics of a document is the more important part of criticism. In order to determine what in the document may be true it is necessary, strictly speaking, to trace in each case the mental operations which began with the observation of the fact and ended with writing the words in the report. Bowley [12] says that it is a good plan before even reading a statistical account to "sit down and think quietly what statistics ought to have been collected, if possible, for the purpose in hand, and what sources of information exist, or should exist." In the case of a wage study the weekly rate, supplementary earnings of other members of the man's family, allowance in annual earnings for periods of unemployment, and so on, should be considered.

Since in most cases an analysis of all the mental operations of the author is out of the question, psychological criticism concentrates on two lines of examination: [13] (1) analysis of the contents of the document to ascertain what the author meant;

[11] *Ibid.*, p. 143.
[12] Bowley, A. L.—*Elementary Manual of Statistics*, 1910, p. 67.
[13] Langlois, *op. cit.*, p. 143.

and (2) analysis of the conditions under which the document was produced in order that the author's statements may be verified and evaluated. Unless a document is critically studied in this way there is danger that the investigator using it as a reference, will read into the text his own opinions —especially in cases where the author's language and thought differ from his own.

A system of loose leaf notes or slips or cards is the most helpful mechanical aid to this analysis. Each slip should indicate for the part of the document cited, the general sense of the text, and the object and views of the author.

It should always be remembered that the literal meaning of the author's language is not a fixed quantity. Such facts as the time in which the document was written, the language of the country, the author's own manner of using language and the general sense of the context all constitute variable factors. In using documents written in a foreign language these considerations apply with special force. In general, however, it is necessary to examine in this critical way only those expressions which, from their nature, are liable to take on different meanings, such for example as, classes of men, institutions, feelings, customs, common objects, terms and units used in social-economic investigations. Does the term "births" used by the author include or exclude still births? Does "foreign population" mean foreign born, native born of foreign parents, or both?

The real meaning of the author's language may be disguised by jests and hoaxes, in allegory, symbolism, allusion, implication, and in such ordinary figures of speech as metaphor, hyperbole and litotes. To detect the existence of an oblique sense in the author's expressions, there should be evidence of absurdity, incoherence, contradiction or obscurity in the literal sense of his statements.

THE AUTHOR'S GOOD FAITH AND ACCURACY

Having determined what the author *meant* we must proceed to a critical estimate of his good faith and accuracy. Owing to the fact that statements in documents are found to contradict one another, it is necessary to examine written records carefully to eliminate errors. The high degree of vitality possessed by spontaneous credulity is shown in the common tendency to accept as true every written statement, as if no author ever lied or was deceived. The scientific student should cultivate the habit of methodical doubt of documentary statements. Although a document may be quite authentic as to origin, this does not in the least establish any presumption in favor of the truth of the statements it contains. As written sources are used, care should be taken by the reader to analyze and criticize *each statement.* This means analytical criticism of the document and not criticism *en bloc.* While our description of this procedure sounds as if it were too slow and intricate to be practicable, this is really not

the case. Methodical doubt consists in the *habit* of performing certain acts of thought. As soon as the initial difficulty is overcome the habit is readily established and methodical distrust and criticism become second nature—performed without consciousness of disagreeable slowness or difficulty.

Beware of putting faith in the form in which a statement is cast. Form does not indicate sincerity or accuracy of the author. The so-called "accent of sincerity" presented by a statement is an illusion. Vehemence in affirmation does not necessarily mean strength of conviction. It often indicates the reverse. Profusion and precision of detail are in themselves not a guaranty of accuracy in facts, however vivid may be the impression they produce upon the reader.

The value of the author's statement is determined by the conditions under which he made his observations. Critical investigation of authorship begins, therefore, with the preparation of a general set of questions which have reference to the possible causes of falsehood. The document is then tested against these questions to discover those causes which may have rendered the author's mental operations incorrect and hence vitiated the results. Criticism of the particular statements contained in the document is carried out by testing each statement against a second list of questions which relate to the causes of inaccuracy characteristic of mental processes.

Are there reasons for doubting the author's good faith because he was placed in one of those situations which ordinarily incline a man to be insincere? It becomes, therefore, a question of motives, and we ask, had the author an interest at stake, did he seek to gain practical advantage for himself by the statements he wrote down? If so, he had an interest in deceiving.

This is the case with most official documents. We must ask what interest the author could have thought he had in misrepresentation. We find the answer in his ideals and tastes. Now it should be remembered that instead of individual interest, the author may have sought to serve some collective interest of a political party, an economic class, or a religious denomination. Much that is given in the United States Senate's report on "Prices, Wages, and Transportation" of 1893, appears to be susceptible of this interpretation.[14] The motive to show the beneficient effect of a Republican tariff on prices, wages and transportation, seems to supply an explanation of the unrepresentative character of the data upon which the final indexes in this report were based. Of 21 industries investigated, 11 were represented by one establishment, each. Although there were 353,444 clerks in the dry goods business, the index for wages in the dry goods business was based on the wages of employees in one store in New Hamp-

[14], [15] and [16], see respectively vol. I, p. 175; vol. III, pp. 857–863; and vol. II, p. 313.

shire, where one porter, eight salesmen, and six salesladies, were employed.[15] No investigation was made into the wages of agricultural laborers, although the United States is largely an agricultural country. Of course their wages would have been low and had they been incorporated into the material upon which the index was based, the latter would have been less high. The wage index for brewers [16] in the industrial class, "Ale, beer, and porter," was based on one brewer in one New York establishment, and weights were not used.

The question of good faith deserves special consideration wherever newspapers are used as sources. The partisan character of editorial columns is well known. Editorial policy is controlled by some individual or perhaps by some corporation. Advertisements may supply a clue to the nature of this influence. The character and frequency of certain types of advertisements appearing in a given newspaper indicate the kind of commercial patronage it receives and may suggest the source or explain the significance of editorial bias. In the news columns, headings are often chosen, that consist of words or phrases appearing below but which, when removed from their context misrepresent the real meaning of the report or distort the evidence in the news columns. In other cases wilful misrepresentation is resorted to. The heading, "Wilson opposes military training" (in large type), with the modifying phrase, "President, in letter to Secretary Baker,

gives reasons for objecting to house democrats making it an issue'' (in small type), gives the reader the impression that the President's letter was written to oppose military training. The truth in the case, is however, quite the contrary, for in the middle of his letter the President makes this statement, ''. . . the moderate and carefully conducted course of military training may have the highest possible advantages,'' and then proceeds to say that the principle of moderate military training to which he had given his approval should not be made a political issue. The newspaper in which these headlines appeared was attached to the most narrow interpretation of Republican party politics.

Was the author placed in a situation in which he was forced to tell an untruth? This situation exists wherever a document has to be drawn up in conformity to rule or custom. In modified degree this question applies to many legislative records of national, state or municipal origin. It should be remembered that statutes or ordinances are records of a compromise of differing opinions on an issue. They should be examined in the light of written records of the discussion which preceded them. This is to study the process by which the compromise was reached, and throws light on motives underlying the action taken. Minutes of the proceedings may be examined and it may sometimes be wise to go back of these to records of special committees in order that their rules of

order may be understood. All this testimony should be checked against the general rules of evidence.

Other questions may now be asked. Was the author influenced by sympathy or antipathy and hence biased to such an extent as to distort facts in representing his opponents in an unfavorable and his friends in a favorable light? Was the author influenced by vanity to violate the truth? Perhaps certain statements in the text were made with a view to impress the reader with the importance or power of the author or the group he represents. Are the statements of the author influenced by desire to please the public? Is there over-deference to public opinion which leads to distortion of facts? Answers to these questions depend upon the particular public group to which the document is addressed and by the special morals or manners of this public. Is there suspicion of dramatic or literary distortion in the statements contained in the document?

Having examined the author's good faith by obtaining an answer to these questions, we must now consider the reasons for doubting the accuracy of the author's statements.

In some cases the author was a poor observer because of forces of which he was not aware such as hallucinations, illusions, mental defects, or prejudices. Do these considerations apply in the document under examination? The best that we can do in answer to such a question is to learn

from information derived from other sources, or by comparison, whether the author had a general tendency to this sort of error. Experimental psychology has demonstrated by laboratory tests that an errorless report is not the rule and that attention does not guarantee accuracy.[17] Of course, the inquiry into prejudices overlaps our previous questioning of motives for falsehood. Yet in this way evidence as to good faith and accuracy becomes cumulative and corroboratory. Finally, it should always be ascertained whether the author has put forth the statement in answer to a question. If this is the case, then we should carefully examine the situation to determine the extent to which the statement as an answer to a question was distorted by a desire to please the interrogator, and by the natural tendency of questions to suggest their own answers.

Was the author badly situated in time and place to observe? The ideal conditions of observation are those in which the observer, without any preconceived idea about the result, was placed where he could see correctly and recorded the observation immediately in a precise system of notation, accompanied by precise indication of the methods used.[18] Since chances of inaccuracy are always present it is necessary to secure an answer to the foregoing question. Perhaps the author was

[17] Whipple, G. M.—*Manual of Mental and Physical Tests*, 1910, pp. 286 *et seq.*

[18] Langlois and Seignobos, *op. cit.*, p. 174.

present at the event, or did really observe the conditions on the spot. Yet even so, failure to record the observation immediately and in precise language may invalidate conclusions based upon his report. We should be careful to distinguish between the author who is a mere witness of the event which he describes and one who is a trained observer. The author who is a scientific observer proceeds by fixed rules and records his observations in language of rigorous precision; whereas the author who is a mere witness, observes without method, and reports in unprecise language, moreover, we do not know what precautions he has taken to make his observations accurate. Most newspaper reports are of witnesses in this sense of the word and not reports of observers. They are not reliable because first impressions and hearsay play such a part in them. The garbled reports of public speeches and addresses are a case in point.

There are other questions to be answered. Was the author at all negligent or indifferent in making his observation? Perhaps from idleness or negligence his report of the event distorts the facts. It is common for reporters to publish accounts of gatherings they never attended.

Was the fact reported of such a nature that it could not be directly observed? This is the case with statistical totals or comprehensive judgments which are propositions derived from observations

only by performing the operations of synthesis or inference. The question, therefore, is this: is the author's report based on sufficient data? How accurate was he in the use of this data? The investigator should consider how far the things or persons grouped in the totals are similar. How far is the group homogeneous? Under the main occupational heading, "textile fabrics," may be grouped persons who differ with respect to (1) sex, (2) age, (3) nature of material worked, e.g., cotton, wool, etc., (4) position in industry as merchant, dealer, manufacturer, or employee, (5) specific task in occupation, and (6) locality. If we were told that 192,147 persons were included under this main heading in Massachusetts in 1909, the information is so wide as to be nearly useless.

All of the foregoing questions, designed to determine the accuracy of the author's statements, are on the assumption that he was the original observer; when, however, it can be established that the author was not the original observer of the facts reported in the document, it is important to search for the original informant whose testimony the author transmits and to test the statements by the aforementioned principles. Such a procedure may not be possible and it then becomes necessary to adopt some principle of criticism of anonymous statements. In this connection the investigator must distinguish between written and oral tradition. In general, written tradition is more reliable. In any case, we must ask: was the

author in the habit of altering his statements from written sources?[19]

Historians have developed the following principles or rules for using anonymous statements. In cases where the fact is opposed to the interest or vanity of the author, or where the fact was so generally known that fraud would have been detected, or where the fact was indifferent to the author so that he had no temptation to distort it, we may conclude that falsehood is improbable and accept the statement as true. In cases where the fact was so "big" that it was hard to be mistaken, the statement may be accepted as correct. Such is the case in matters of custom where the fact covered a long period of time, and was so widely dispersed that many people knew of it, or where it was expressed in such general terms as to be obvious to the most superficial observer.

Determination of particular facts given in documentary statements is made by the method of comparison. Comparison is facilitated by the method of slips.[20] Contradictions found in statements may be real or only apparent. When there is real contradiction, it is a good rule to suspect one and not to split the difference. But agreement in statements is not demonstration. Corroboratory statements must be independent in origin before they can be accepted as conclusive. The investigator should find an answer to the question: are the statements independent or a reproduction of

[19] *Ibid.*, p. 184.

[20] *Supra*, pp. 22, 25.

some initial observation common to them all? Perfect similarity between statements is more to be distrusted than occasional coincidence. "The only observations which are certainly independent are those which are contained in different documents, written by different authors, who belonged to different groups, and worked under different conditions." [21]

Although agreement between documents may lead to conclusions that are indefinite, it is nevertheless true that in general, different facts, each imperfectly proven, corroborate one another when they harmonize. In cases where there is disagreement between documentary statements and the results of contemporary observations, the probability is that the latter are true. The most, therefore, that can be concluded in regard to particular statements made by authors is a high or low degree of *probability*—there is never absolute certainty.

SUMMARY OF PRINCIPLES OF CRITICISM

We may now summarize and recapitulate the principles of documentary criticism by enumerating them in order.

a—Discover what other investigators have done before beginning field work.

b—There is fundamental need of scepticism of statements contained in documents to offset usual credulity in their use. Develop the habit of methodical doubt.

[21] Langlois and Seignobos, *op. cit.*, p. 203.

c—Documents supply only indirect and hence incomplete and inaccurate knowledge of facts.

d—Documents should first be criticized as to their external or objective characteristics.

(1) Authorship should be critically examined.
(2) Sources should be critically classified.
(3) The investigator should avoid hypercriticism which makes the tool the goal and not the means to the end of knowledge, of the truth.

e—Documents should then be criticized as to their internal or subjective characteristics. This is the more important division of criticism. It is analytical criticism.

(1) What did the author mean by this particular statement? What is its real meaning as distinguished from its mere literal meaning?
(2) Was the statement made in good faith?
  (a) Had the author interest in deceiving the reader?
  (b) Was the author under pressure to tell an untruth?
  (c) Was he influenced by sympathy or antipathy to tell an untruth?
  (d) Did vanity influence him?
  (e) Was he influenced by public opinion?
  (f) Is there evidence of literary or dramatic motives to distort the truth?
(3) Was the statement accurate? or more particularly:
  (a) Was the author a poor observer because of mental defect or abnormality?
  (b) Was the author badly situated in time and place to observe?
  (c) Was he negligent or indifferent?
  (d) Was the fact of such a nature that it could not be directly observed?
  (e) Was the author a mere witness or a trained observer?
(4) When it appears that the author was not the original observer it is necessary to determine

the truth and accuracy of his sources of information.

f—Particular facts may be determined by the procedure of comparison which weighs the importance of contradictions and agreements and concludes at the most with a determination of the degree of probability.

PARTIAL LIST OF COMMON DOCUMENTARY SOURCES

List of common documentary sources of information about social conditions and relations. This list is not an exhaustive catalogue but a citation of certain typical sources suggestive of the variety and wealth of material available, through which the investigator may forage for himself.

a—Statistical sources of public or official character.

(1) Publications of the Federal Government.

Agriculture, by the Department of Agriculture since 1862: Office of Agricultural Experiment Stations; Bureau of Chemistry, charged with administration of food and drugs act; Forest Service; Office of Public Roads and Rural Engineering; Biological Survey; Federal Horticultural Board; Bureau of Soils; Bureau of Animal Industry; and Bureau of Crop Estimates.

Banks, statistics of, in annual reports of the Comptroller of the Currency.

Children's Bureau of the Department of Labor, since 1912, statistical reports, investigations, monographs, on infant mortality, child labor, birth registration.

Census Bureau of Statistics, prior to 1902 as a temporary bureau of the Department of Interior, since 1902 as a permanent office in the Department of Labor and Commerce, and since 1913 as the Bureau of the Census in the Department of Commerce. Besides decen-

nial census of population, agriculture, occupations, manufactures, mines, the Bureau of Census takes in the course of each decade a census of manufactures, wealth, debt and taxation; dependent, defective and delinquent classes; religious bodies; and in cooperation with the Bureau of Fisheries, a census of fisheries; quinquennial census of electric light and power plants; street and electric railways; telegraphs and telephones; annual statistics of mortality for the registration area; financial statistics of cities of over 30,000 inhabitants, as well as special inquiries.

Foreign Commerce, statistics of, began in 1789 by the Treasury Department and since 1866 by the Bureau of Statistics of said department, for custom duties, foreign commerce, imports and exports, tonnage of vessels, coasting trade statistics, vessels registered, enrolled and licensed, etc.

Internal commerce, statistics of, since 1866 by Treasury Bureau of Statistics, of commercial movements at interior centers, domestic commerce on great lakes, receipts and shipments at principal North Atlantic seaports, coastwise commerce, lumber, naval stores, Pacific coast commerce and lumber shipments, river and canal traffic, statistics of coal mined and shipped, and ocean freight rates.

Corporations other than banks, statistics of, also of common carriers, by the Bureau of Corporations of the Department of Commerce and Labor since 1903, beef industry, petroleum industry, cotton exchanges, tobacco industry, steel industry, lumber industry, etc. Since 1914 corporation statistics also gathered by the Federal Trade Commission.

Immigration statistics, by Bureau of Immigration of Treasury department since 1891, and by Bureau of Immigration of Department of

Commerce and Labor since 1903, by Bureau of Immigration and Naturalization since 1906, and since 1913 by two agencies: Bureau of Immigration, and Division of Naturalization.

Labor Statistics, adequately collected since 1884, consecutively by Bureau of Labor of the Department of the Interior in 1884, Department of Labor in 1888, Bureau of Labor of the Department of Commerce and Labor after 1903, and by Bureau of Labor Statistics of the Department of Labor since 1913; industrial depressions, convict labor, strikes, lockouts, conditions of work, compilations of labor laws, insurance of workingmen, workmen's compensation, bi-monthly bulletins up to 1912, since 1912 bulletins in the form of monographs, index figures of wages and prices, since 1915 a monthly review, administers Federal Compensation Act, a nineteen volume report on Women and Child Wage Earners in the United States.

Foreign Markets, statistics of, since 1912 given in reports of Bureau of Foreign and Domestic Commerce, with which the Bureau of Statistics in the State Department and the Bureau of Manufactures were merged; give statistics compiled by consular service, commercial agents and attachés.

Railways, statistics of, prior to 1887 found in reports of the Department of the Interior, Treasury Bureau of Statistics and Census Office, since 1887 in reports of the Interstate Commerce Commission.

Schools and colleges, statistics of, by the Bureau of Education.

Temporary agencies of statistical inquiry: Senate Committee on Finance, report on Retail Prices and Wages in 1892; Wholesale Prices, Wages and Transportation by same commit-

tee in 1893; report of the Industrial Commission in 1902; Immigration Commission reports in 42 volumes covering the dates 1820–1910; United States Monetary Commission in 1908; Tariff Board in 1911; Select Committee on Wages and Prices of the U. S. Senate in 1913; Commission on Industrial Relations in 1915.

(2) Official statistical reports and publications by foreign governments: Australia, Austria, Belgium, Canada, Denmark, France, Germany, Great Britain and Ireland, Hungary, India, Italy, Japan, Netherlands, Norway, Russia and Sweden. See *The History of Statistics,* edited by John Koren, pub. 1918.

(3) Publications of State governments (as in 1915).

Agricultural statistics, by boards or departments in Alabama, Arkansas, California, Colorado, Florida, Georgia, Illinois, Kentucky, Michigan, Mississippi, Missouri, Nebraska, New York, North Dakota, Oklahoma, Oregon, Pennsylvania, South Carolina, Texas, Vermont, Virginia, and West Virginia.

Arbitration, conciliation and mediation, boards or commissions in Alabama, California, Illinois, Iowa, Louisiana, Maine, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New York, Oklahoma, and Pennsylvania.

Census of population is taken at decennial periods between the Federal Census in the following states: Florida, Iowa, Kansas, Massachusetts, New Jersey, New York, North Dakota, South Dakota, Rhode Island, and Wyoming.

Health boards or departments of in Arkansas, California, Massachusetts, New Hampshire, and Tennessee.

Immigration, bureau, board or department in

Colorado, Hawaii, Idaho, Minnesota, New York, and Utah.

Labor, by industrial commission, bureau or department, in Arkansas, California, Colorado, Connecticut, Delaware, Florida, Georgia, Hawaii, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Jersey, New Mexico, New York, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Philippine Islands, Porto Rico, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia and Wisconsin.

Mines and mining, by bureau or inspectors in Alabama, Alaska, Arizona, Arkansas, Colorado, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Missouri, Nevada, New Mexico, Oklahoma, Pennsylvania, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia and Wyoming.

Minimum wage commissions in Arkansas, California, Colorado, Kansas, Massachusetts, Minnesota, Nebraska, Oregon, Washington and Wisconsin.

Workmen's compensation by industrial accident commission or board, in California, Colorado, Connecticut, Hawaii, Illinois, Indiana, Iowa, Maine, Maryland, Massachusetts, Michigan, Montana, Nevada, New Jersey, New York, Ohio, Oklahoma, Oregon, Pennsylvania, Texas, Utah, Vermont, Washington, West Virginia and Wisconsin.

(4) Reports of local and municipal boards or departments of health, charities, corrections, welfare and inspectors of buildings, etc.

b—Statistical sources of private or unofficial character

(1) Reports and records of charitable or philanthropic agencies.
(2) Pay-rolls and reports of various industrial establishments.
(3) Reports of private commissions, committees, bureaus of municipal research, and other private investigating agencies.
(4) Reports of banks and insurance companies.
(5) Reports of business agencies, employers' associations, boards of trade and chambers of commerce.

c—Legal information based on Federal, State and local legislation may be obtained from the following sources:
(1) Statutes of the Federal Government.
(2) General laws of the State, especially editions of "revised laws" or "codes."
(3) Special laws relating to the locality or to localities of the same class.
(4) City Charters.
(5) City Council Ordinances, rules of the Board of Aldermen, Health Board, Police Department, Commissioners, etc.
(6) Regulations of various city and town departments.

d—Investigations are conducted by the reports published by the following social agencies of national scope.
American Association for Labor Legislation, 131 East 23 St., New York City.
American Association for Organizing Family Social Work, 130 East 22 St., New York City.
American Child Hygiene Association, 1211 Cathedral St., Baltimore, Md.
American Public Health Association, 755 Boylston St., Boston, Mass.
American Red Cross, Department of Civilian Relief, Washington, D. C., and fourteen divisional offices. West 40 St., New York City.
American Social Hygiene Association, Inc., 105

PART II

SCOPE AND ORGANIZATION OF FIELD WORK

CHAPTER III

TYPES OF FIELD WORK AND THEIR PROBLEMS

When the investigator has gathered all the available information about his problem which may exist in documents and written records, he is ready to undertake field work *provided* that the documentary material covers the problem only incompletely.

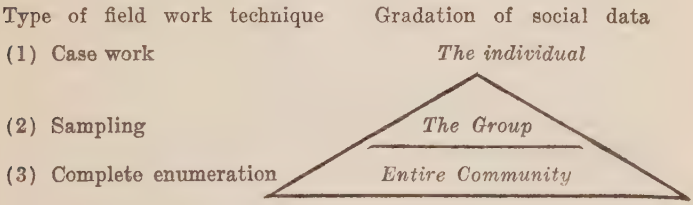
Field work should be carefully planned and never hastily entered upon. Three tolerably distinct techniques have been developed in the field work investigation of social conditions, each adapted to a particular class of problems and designed for the handling of special kinds of data. The student should determine which type of field work is best suited to the kind of problem confronting him, and whether a combination of two of the special techniques will not be advantageous. These considerations apply in planning out the field investigation.

THE THREE TYPES OF FIELD WORK

Field work falls into the following three types, each distinct from the others in its main characteristics although blending off to details in the application:

(1) case work—the intensive investigation of individuals or families.
(2) sampling—the selection of a representative portion less than the whole—the partial canvass.
(3) complete enumeration—as in a government census—a full canvass.

These three types of field work roughly correspond to a threefold gradation of social data: the individual, the group, and the entire community. The first consideration in planning field work is then to select the type of technique best adapted for the direct study of the class of social data actually involved in the problem under consideration. This distinction may be made clear by representing the unit to be investigated as corresponding to the apex, an upper cross-section, and the base of a triangle, thus:



PROBLEMS OF FIELD WORK

In case work the focus of interest is the individual, but the central problem of method is the trained field worker. In sampling the focus of interest is the group or some part less than the

whole, but the central problem of method is selection of the part to be studied. In complete enumeration there is no focus of interest since the whole population is to be studied and the central problem of method is organization of a field staff of untrained workers.

The problems of field work may be conveniently grouped under five headings: (1) sources of data, (2) methods of recording unbiased observations of social facts, (3) the selection and instruction of the field staff, (4) organization and supervision of field work, and (5) the editing of data on schedules. These different problems will be given detailed treatment in the chapters that follow, but in order that the student may obtain a coherent and unified view of them, a brief outline of each will be given in this chapter followed by descriptions of several important investigations which illustrate all of the different types of field work in combination.

The sources of field work data to be used in any given study, depend upon the character of the problem under consideration. Visits to individuals or families in their own homes may be necessary. In some cases visits to mills, interviews with foremen and managers, or conferences with public officials or others in a position to supply information or to direct the investigator to points of vantage, may be requisite. Field work often involves the use of employer's pay-rolls, public records of vital statistics, records of fraternal and

labor organizations and of national welfare societies. Such sources as the latter should be subjected to critical examination in the light of the principles developed in the last chapter.

One of the most difficult problems of field work is that of establishing conditions which encourage the recording of unbiased observations of social facts. In the first chapter, we discussed the general aspects of this problem from the point of view of social science. In chapter vii, this problem will be treated in considerable detail and the various mechanical aids to correct observation and accurate recording described. At this stage in our treatment of field work, it will be advantageous simply to mention the chief elements in this problem of observation and recording.

First impressions are often lasting, but frequently untrustworthy. How may we make our initial observation of the social fact, both lasting and accurate? A satisfactory answer to this question will be found if we can discover how the impression may be objectified and the recording of it standardized. The schedule used by the field worker is a mechanical device which is designed to provide him with a method of limiting or controlling his observation and of standardizing the method of recording that observation. In so far as inquiries on the schedule are put in a form which can be answered by a numerical or quantitative statement or by "yes" or "no," the subjective characteristics of the field worker

which may bias his opinion are eliminated. Schedules follow standard forms so that the recording of the observation is methodical and precise.

Trained observers are much to be desired, yet it is difficult to secure the services of expert field workers. It is rarely the case, as in the Pittsburgh Survey, that a field staff of competent experts can be gathered together. The director of an investigation must often be satisfied with trained field workers as chiefs of important branches of investigation, or as supervisors, and fill out the rank and file of his staff with a partially trained personnel. The extreme of this is found in the work of a government census, in which the posts of "expert special agents" are hard to fill, in which many of the supervisors or inspectors lack special training, and in which the great army of enumerators is made up of wholly untrained field workers. To a considerable extent the disadvantage of an untrained staff of field workers, may be offset by thorough organization of the field work. Careful preplanning of all details, so that the great majority of difficulties of canvass in the field may be anticipated and guarded against, instruction of the field staff in the essentials of their work before it is begun, and the preparation of standard forms of schedules and written instructions, do much to neutralize personnel drawbacks.

Adequate supervision and inspection of work

in the field as the canvass or investigation progresses should be provided for in the organization of the inquiry. Supervisors or inspectors should hold frequent conferences with field workers to answer their questions and to straighten out complications. Examination of their daily work by inspectors is essential to complete and accurate returns by field workers. Regular and methodical reporting by each field worker every day to the central office of the director, where practicable, is often a good plan. Reports on the progress of the investigation in the field should be made periodically by inspectors or supervisors. Field work organized in this way will produce returns which require a minimum of editing in the office after the investigation is completed.

THE INVESTIGATION OF INDUSTRIAL RELATIONS

The field work investigations of the United States Commission on Industrial Relations [22] supply an excellent example of organization and method in social research. The public hearings conducted by this Commission and given wide publicity through the daily press attracted considerable attention. The field work study is not so generally known but it provides an illustration of some of the important principles of organized social study.

In charge of the investigation was a director

[22] Described in *The Survey*, vol. 33, no. 22, p. 578 *et seq.*, Feb. 27, 1915.

and an assistant director. There were nine divisions to the inquiry, each with its own chief and staff of field workers. The divisions were as follows:

1. Legal and legislative.
2. Labor organizations and collective bargaining.
3. Unemployment.
4. Agricultural problems.
5. Education and preparation for life.
6. Welfare and social insurance.
7. Safety and sanitation.
8. Underlying causes of industrial unrest.
9. Women in industry.

A methodical reporting system was devised whereby daily and weekly reports were made by men in the field. Each field worker, immediately upon the completion of a distinct phase of his work, reported to the chief of his division. These reports were subsequently sent to the central office for file. At intervals of from six weeks to two months, each division director reported to date, on investigations of his field staff. These reports were known as "preliminary reports." The reports of field workers sent to the central office formed the appendices to these preliminary reports. The advantages of such a reporting system were that the director of the investigation had at his finger tips all the time the complete output

of the investigation to date and at any time could turn in a final report.

Supplementary to this system of field work reporting, a complete library system of records was established. Under the direction of a trained librarian, everything was indexed and cross-indexed under subject, industry and locality (including testimony taken at public hearings). The result was that any part of the great volume of material could be found at any moment without difficulty.

The personnel of the field staff was unusually high for social and industrial inquiries. In the Legal and Legislative Division of the investigation, field workers had the following qualifications: Field worker number one had been a graduate student in social science at a well-known university and had there served as a teacher of economics, he had also served as statistician of a State Industrial Commission and for six years had been secretary to a congressman. Field worker number two had been a graduate student of economics and a teacher of economics in a university and had made a field work study of local government in corporation-controlled communities in the United States. Field worker number three had been a dean of women at a university, she had studied sociology in the graduate department of another university, and had received special training in psychology. In the Division on Labor and Collective Bargaining, the chief was a professor

of statistics in a university, and on his field staff were four university professors of economics, each with a reputation in his own field, and one other man who had been a graduate student of economics and had served as an expert in a State Bureau of Statistics. The chief of the Division on Unemployment was a well-known student of the subject, which he had investigated in Europe and America at first hand; he was assisted by three trained economists with field work experience. Other divisions were similarly composed of trained investigators.

HEALTH INVESTIGATION

Another example of well-organized social investigation is that of the field work study of the Health Insurance Commission [23] of the State of Illinois into the standards of living of wage-earning families in Chicago. Since the object of this part of the Commission's work was to secure data on sickness, medical services and protection against health risks, the families to be studied were selected in three ways: (1) a block study, (2) a nursing service study, and (3) a charity study.

In the block study the following procedure was used. A canvass of every family on certain blocks representative of the group of wage-earners in Chicago, was determined on rather than a visit

[23] *Report of the Health Insurance Commission*, May 1, 1919, pp. 179–184.

to families selected at random throughout the city, because the former plan gave greater opportunity for control and selection of families and for verification of results. The social block (instead of the geographical block), consisting of two sides of a residential street, was made the unit of investigation, since the social block represents a natural social grouping. Blocks were carefully chosen to represent such essential elements of their social composition as, physical structure, racial composition (normal distribution of different immigrants and racial groups in Chicago), economic condition (adequate representation of all degrees of economic condition from casual laborer to skilled workman), and location with reference to such social resources as dispensaries, hospital and welfare agencies.

The nursing study of 304 families selected by the Visiting Nurse Association from their own cases was designed to represent the problems involved in medical service.

One thousand families in which sickness of the wage-earner was considered as a problem entering into dependency were obtained from the United Charities and Jewish Aid Society's lists. This group was chiefly composed of "current" cases, that is, of families receiving relief or supervision. There was also a considerable number of "closed cases," that is, families which at the time had regained independence, but which a short time before had been receiving aid. Some

FAMILY SCHEDULE.

On list of.....

Schedule number .....

Investigator .....

Date .....

HEALTH INSURANCE COMMISSION.

Family Schedule, F. 2.

1. .....
Nationality of family. Name. Address.

2. .....
House or apartment. Front or rear. Floor. No. of rooms. No. of persons.

3. .....
Condition of house: Good—fair—bad; Clean—dirty—filthy. Rent per mo.

4. Family Status and Employment.

Members of family.	Sex.	Age.	Present or usual employment.	Average earnings per week.	Weeks unemployed last 12 months because of		Earnings last 12 mos.	No. of employers during last 12 mos.
					Sickness.	Other reason.		
Father ..	.....	.....	.....	.....	.....	.....	.....	.....
Mother ..	.....	.....	.....	.....	.....	.....	.....	.....
Children:								
1.	.....	.....	.....	.....	.....	.....	.....	.....
2.	.....	.....	.....	.....	.....	.....	.....	.....
3.	.....	.....	.....	.....	.....	.....	.....	.....
4.	.....	.....	.....	.....	.....	.....	.....	.....
5.	.....	.....	.....	.....	.....	.....	.....	.....
6.	.....	.....	.....	.....	.....	.....	.....	.....

5. Other sources of income (specify).....

6. Total family income last year?.....Surplus or deficit?.....

7. How was deficit met? (enter relief in full).....

8. Value of property owned.....Encumbrance on same.....

9. Other indebtedness .....

Figure 3. Family Schedule used in investigations by Health Insurance Commission of Illinois.

10. Sickness during last 12 months.

Members of family.	Nature of illness.	Duration.	Doctor employed (Co. or other).	Doctor bill.	Hospital care (name).	Hospital bill.	Nursing care—by whom and cost.
Father ..	.....	.....	.....	.....	.....	.....	.....
Mother ..	.....	.....	.....	.....	.....	.....	.....
Children:							
1.	.....	.....	.....	.....	.....	.....	.....
2.	.....	.....	.....	.....	.....	.....	.....
3.	.....	.....	.....	.....	.....	.....	.....
4.	.....	.....	.....	.....	.....	.....	.....
5.	.....	.....	.....	.....	.....	.....	.....
6.	.....	.....	.....	.....	.....	.....	.....

11. Dispensary record during last twelve months.

Members of family.	Names of dispensaries visited with number of visits to each.	Nature of ailment.	Nature of treatment.	Dispensary charges.	
				Admission fee.	Charge for medicines or operation (specify).
Father	.....	.....	.....	.....	.....
Mother	.....	.....	.....	.....	.....
Children:					
1.	.....	.....	.....	.....	.....
2.	.....	.....	.....	.....	.....
3.	.....	.....	.....	.....	.....
4.	.....	.....	.....	.....	.....
5.	.....	.....	.....	.....	.....
6.	.....	.....	.....	.....	.....

12. .....

Doctor's fee for house visit. Office visit. Cost of medicine for the year.

13. How is dental work secured?....Cost of dental work for the year?....

14. Note any neglect of dental work.....

15. Insurance.

Members of family.	Life insurance.				Sickness insurance or sick fund.		
	Am't. carried.	Name of company.	Type of company—industrial, fraternal, order, union, etc.	Weekly premium.	Name of carrier or fund.	Weekly premium.	Weekly benefit.
Father ..	.....	.....	.....	.....	.....	.....	.....
Mother .	.....	.....	.....	.....	.....	.....	.....
Children:							
1.	.....	.....	.....	.....	.....	.....	.....
2.	.....	.....	.....	.....	.....	.....	.....
3.	.....	.....	.....	.....	.....	.....	.....
4.	.....	.....	.....	.....	.....	.....	.....
5.	.....	.....	.....	.....	.....	.....	.....
6.	.....	.....	.....	.....	.....	.....	.....

16. Note lapses of insurance policies with reason.....

.....

17. For each member of family who received insurance during the last twelve months, specify amount received and state what was done with life or industrial insurance policies paid.....

.....

18. What, if any, provision is made by any of the above institutions (in "15") for medical or nursing care?.....

.....

19. Has any death occurred in family in past year?.....

If so, cost of burial?.....

20. Has a child been born in family during past year?.....Physician or midwife employed?.....Fee of same.....

.....

Nursing care and fee. Hospital service. Hospital bill.

If employed, number of weeks absent from work before confinement?..

If employment resumed, number of weeks after confinement?.....

21. Note here any significant facts not entered above, such as: (a) illness of long standing and doctor employed and bills; (b) connection of doctors with dispensary; (c) quack doctors and patent medicines; (d) delay in securing treatment with reason; (e) attitude towards dispensary; (f) changes in standard of living due to sickness (moving to cheaper quarters, wife or children taking employment, etc.); (g) charity record, including date of first application and any information bearing on the cause of the situation, the income per month while helped by charity during present emergency, etc. All of these points may possibly be combined into a story.

APPENDIX B. INSTRUCTIONS FOR INVESTIGATORS.

General.

The General Assembly of Illinois by Act approved June 23, 1917, created a special Health Insurance Commission. It is collecting data for its report. Data collected are for scientific use only; all information must be regarded as confidential. In all cases these things should be explained and persons interviewed should be told that the facts given by them will not be used except in making up general tables. It should be made clear, also, that this is a *government investigation.* Each agent collecting data will have proper credentials, countersigned by the Governor of the State. Agents should secure accurate information bearing upon such points as find place in this schedule. Be careful to set down everything you learn of any importance for the purpose of the investigation. Pertinent information not fitting into any special place should be entered at the end of schedule.

Those collecting data for the commission should seek to develop the coöperative spirit on the part of those interviewed. Unless this is developed good data cannot be secured. Thought, patience, tact, and courteous treatment are indispensable. Investigators must not *demand* anything; they should be able to *command* everything because of the tremendous importance of the data to everybody.

Every question must have an answer. Where information cannot be obtained, write "n.r." for no report. Where the question is not in point, either because of the answer to a previous question or for other reasons, draw a dash in the space for the answer.

Write so that entries can be read.

Detailed Instructions.

"On list of" means United Charities, Central Free Dispensary, Block 4700 South Halsted, etc. Schedules of each investigator are to be numbered consecutively, beginning with 1.

1. Nationality. If white and native born, enter "U. S. White;" if colored, enter "Negro;" if foreign born enter, as a rule, country of birth (e. g. Italy), but in case of Austria and Russia indicate race by entering "Russian Jew," "Galician Pole," etc. Country of birth or race of father determines entry.

2. Enter H. or A. A house is a one family dwelling. The two following entries are not to be filled out for house:

F. or R. (Front or rear). This refers to location of apartment in the house. If a middle or through apartment is found write that in. If apartment is in a rear house, that may be indicated by giving first location in the house and adding "R. H." Enter B or floor number. Enter number of persons including lodgers.

3. Enter G, F or B and C, D or F.

4. Enter only children living at home and children who have died within the last 12 months. Names of children should be entered and in order of birth. If father, mother or child is dead, enter that fact with date of death in space immediately following name. Present employment, earnings per week, lost time, and yearly earnings can be worked together. Average earnings per week means at present or when on last job. In general, the weekly and yearly earnings should check when proper allowance is made for unemployment. One exception to this is when the rate of pay has changed during the year; another when women and children have started to work during the year. Either fact should be explained in note.

If unemployed write in "unemployed" and give usual employment. If present employment differs from usual, give both.

Give specific nature of job and industry, e. g. Laborer-Stock Yards. If man changes employers frequently enter "Casual" e. g. Labor-casual. Enter "o. a." if in business for self, e. g. "Grocer-o. a."

Weeks unemployed is to be filled in for wage-earners only. Weeks unemployed because of sickness refers to sickness of wage-earner only. Unemployment because of sickness of others should be entered under "other reasons." "Other reasons"—do not specify reason. Give total weeks unemployed. Notice this does not include single days unemployment.

Members of the family who did not start work until some time within the year are not to be counted unemployed for the time when that was their normal condition. If they work because of sickness of wage-earner, be sure to note that fact under "21."

Number of employers during year—not jobs. Names of employers not wanted.

5. Enter amount from each source. Probable sources are boarders or lodgers, rent from property, insurance policies, sick benefits. Do *not* include relief or gifts.

6. Total family income will normally equal sum of earnings in 4 plus 5. When there are children of legal age whose earnings are not contributed to family income, put their contributions under 5 and explain in note why 6 does not equal 4 plus 5.

Surplus or deficit—give amount. Where deficit is made up by relief in kind, estimate value if possible; otherwise itemize things actually received.

7. Specify amount from each source; get relief from U. C. from their records. Notice that other indebtedness (9) is repeated here unless incurred previous to last year.

8. Enter only value of real property owned.

9. Bills overdue, but not current bills are to be entered. Specify nature and amount of each debt, e. g. "grocer, $20."

10. Make some entry for every member of family in order used

in 4. Names need not be re-entered. Answer every question for every sickness. If one member of the family has had more than one sickness, use two lines and change numbering at sides. As to what constitutes sickness, the investigator must use his best judgment. Do not enter minor chronic complaints such as ordinary rheumatism, indigestion, etc., which do not incapacitate patient for usual work. Serious complaints such as tuberculosis should of course be entered even though patient is still at work. In other cases, do not count a wage-earner ill unless he is incapacitated for work for a week or more and do not count others ill unless they are confined to bed for that same time. Exception to this rule should of course be made in any case of any important shorter illness, as e. g. removal of tonsils. Maternity cases, including abortions, etc., are not to be included here but listed under 20.

Duration. Usually time lost or confined to bed. Express in weeks. Cases in which patient is partially incapacitated present more difficulties: duration may be counted from time patient stopped his usual for lighter work, from time of diagnosis if there is reason to think it was diagnosed reasonably early, or from time when patient first complained. If duration is over a year, express in years and months.

Doctor. Specify county or other. Do not enter name of doctor.

11. Make entry for every member of family as in 10. Enter visits for examination as well as for treatment. Nature of treatment. Be as specific as possible.

12. This means fee for each visit.

15. Make entry for each member of family under both life and sickness insurance. Include insurance at present carried and insurance carried at time of death for members of the family who have died in the past 12 months. Care should be taken to get accurate information on these questions.

Amount. If children's insurance varies with age and length of time policy is held, give minimum and maximum.

Name of Company. If there is not space to write out name, abbreviate and explain abbreviation in footnote except for well-known companies, e. g. "Prudential," "Metropolitan."

Under sickness insurance, weekly benefit means the benefit called for by the policy not the benefit actually received. Enter the amount of cash benefit and add "And medical attention" or whatever is necessary to indicate the rights of the insured. If more space is needed write "note" and describe fully at end of schedule or bottom of page.

20. Include still births, miscarriages and abortions. Enter "P" or "M." If nursing care given by association, e. g. "VNA"—specify. Enter name of hospital.

372 cases had to be thrown out because of incomplete information, moving away or family disintegration, leaving 628 cases finally available for intensive study.

The same schedule was used in all three divisions of the investigation. This schedule was developed after an examination of schedules used in family studies made elsewhere. A trial schedule for experimentation was first mimeographed and the final revision (see figure 3) in the light of experience included the following inquiries. "In addition to the usual inquiries in regard to name, address, nationality, housing conditions and rent, the items of the schedule center about family composition; employment, income, surplus and deficit; value of property owned; the sickness history of every member of the family during the last twelve months; provision, need and cost of dental work; the amount and type of life and disability insurance carried by members of the family; the dispensary record for all members of the family during the last twelve months; deaths in the family during the year and cost of burial; births in the family during the year; the employment of physician or mid-wife; and the cost of nursing care and hospital service. A most valuable part of the schedule was the page assigned to a history of the family known as the 'story' in which were entered the significant facts not otherwise specifically called for, as, for example, the sickness experience of the family during a period

of years, their attitude towards physicians, dispensaries and social agencies, changes in the standard of living during the year due to sickness, complete charity record, etc.'' [24]

The field staff of this investigation was selected on the basis of background of social training, as well as of experience and success in social investigations. Command of languages of the chief immigrant groups of Chicago was another qualification. The field workers were either advanced students of economics and sociology at the University of Chicago and the Chicago School of Civics and Philanthropy, Registered Nurses of the Visiting Nurse Association, or experienced salaried investigators.

Instruction and supervision of the field work was provided for. Each investigator was given a card of identification by the Commission which certified his appointment as an official agent of the government. Mimeographed instructions were supplied each field worker covering in detail the items on the schedule. Before the field work began conferences of the staff were held for careful and detailed interpretation of the schedule and for instruction in regard to methods of approach and technique of investigation. Inexperienced investigators were given a demonstration and supervised in the field by the official supervisors of the Commission. Field workers were instructed to state at once to perspective informants the pur-

[24] *Ibid.*, p. 181.

pose of their visit and the object of the investigation in order to secure intelligent coöperation from the family in making out the schedule. Schedules filled out in the field were promptly edited for conference with the field worker in regard to inaccurate or incomplete entries. Out of 2,708 wage-earning families in the "block study," only 110 gave incomplete reports of total family income, an entry considered one of the most difficult to secure.

The method of verifying returns is well outlined in a paragraph from the report.[24a] "The Commission availed itself of every opportunity to verify and to correct the data secured by its agents in the field. The leading welfare agencies in Chicago maintain more or less complete records of all the families they serve. Practically all of the more important social agencies register their cases either with the Social Service Registration Bureau or with the Central Bureau of the Jewish Charities. Agents for the Commission cleared all the schedules collected in the family study through these two registration bureaus. Through the cooperation of the Cook County Agent all schedules were also cleared through his branch offices in order to verify the statement of the family of the fact of aid received and to determine the exact value in money of the monthly supplies issued. So far as the records made it feasible, all cases were also cleared through the different dispen-

[24a] *Ibid.*, pp. 181–3.

saries of Chicago. The Municipal Tuberculosis Sanitarium gave valuable assistance to the Commission by reporting the exact medical diagnosis in all tuberculous cases recorded by it. It should also be restated here that the records of the United Charities and of the Jewish Aid Society had been consulted by the agents for the Commission prior to their visit to the families. In addition to the obvious value of this pooling of all accessible data by clearing all cases through the different medical and charitable agencies of the city, two significant conclusions were derived. The first was the general confirmation of the completeness and accuracy of the information obtained by the investigators for the Commission. Only in relatively few cases were there serious omissions or discrepancies requiring correction. In the second place, records of dispensaries often made possible a precise medical definition of the nature of the ailment. The difference was one of precision rather than correctness of the statement, however, because the reports of the family were with but few exceptions confirmed by the examination of the medical record."

INFANT MORTALITY

One of the most interesting field work investigations is that of the Federal Children's Bureau in its studies of infant mortality.[25] The usual

[25] Allen, N. F.—*Infant Mortality, results of a Field Study in Saginaw, Mich.*, Children's Bureau Pub., No. 52, 1919.

method of studying infant mortality is to obtain from official records the number of deaths of infants under one year of age per 1000 live births. Still births are excluded from both numerator and denomenator of the ratio. The usual approximate method is to divide the number of registered infant deaths under one year of age for a given calendar year, by the number of registered live births for the same year. But this method secures among the deaths, inclusion of deaths of infants born in the preceding calendar year or in a different area, as well as deaths of infants born in the same calendar year. Moreover, it excludes deaths of infants included in the group of births if the deaths occurred either in a different area or in the following calendar year. In other words, the two numbers used in the ratio (births and deaths), do not refer to the same group of infants. This inaccuracy is necessarily contained in all infant mortality rates for large areas, making these rates mere approximations to the true infant mortality rate. Since, however, all infant mortality rates for large areas contain these same errors, they are fairly comparable.

The United States Children's Bureau attempts to avoid these inaccuracies by its special method of field work study of infant mortality. Each infant born in a selected area in a certain calendar year is followed through a period of twelve months. The general plan of procedure is as follows: to the schedule are first transferred the

birth certificate data for the year selected; next, data from the infant's death certificate for the year selected and also the following year are copied and facts as to deaths of infants born in the year selected are transferred to the schedule (the address of the mother was usually obtained from these records); finally, the field worker visits the homes and by means of personal interviews with the mothers collects data about the babies' lives to the end of their first year, or until death if death occurred under one year of age.

Before field work is started, the purpose and nature of the investigation is explained fully through newspapers, by clergy (especially of non-English speaking peoples), by city officials, civic leagues, in mothers' and other women's clubs. This prepares the way for the field work and helps to overcome obstacles of ignorance and suspicion. Field workers then proceed to the collection of records of births and deaths from official departments of the city. As before stated, the data on birth and death of each infant born in a selected calendar year, is transferred to the schedule. Several groups of infants for whom information is inaccurate or incomplete, are excluded as follows: illegitimate births, births to mothers during the year who moved away to live in another area, and births which occurred to non-resident mothers. Irregularities in records of births and deaths require careful treatment. Records of deaths of infants in the selected area

WARD No. ..... B. C. No. ..... D. C. No. .....

BABY. 1. M. F. 2. L. I. 3. L. B., S B.; At 1 year: Alive, Dead

4. Date birth

5. Phy'n, Mwf.—Name

Address

6. Death (a) Date (b) Age mos.

(c) Causes

(d) Physician

Defects, Deforms.: None, Over. Eyes: OK Over

7. Feeding (Months)	1	2	3	4	5	6	7	8	9	10	11	12
(a) Breast												
(b) Mixed												
(c) Artificial												
(d) Night feedings												
Reasons for change												

8. Milk dealer (a) Name

(b) Kind: Grocery, Dairy, Farm, Cow shed

FATHER. 9. Nationality

10. Age 11. Sp. Eng.: Y. N. 12. Rd. & Wr.: Y. N. 13. Yrs. U. S.

14. Occ.

Ind. Empr. OA, WE

HOME. 15. Street, alley. 16. Front, rear. 17. Fams. in bldg.

18. Persons: (a) Family (b) Lodgers (c) Others

(d) Total: 19. Rooms 20. Vent'n: (a) Means G. F. P.

(b) Results, Good, Fair, Poor 21. Clean, Medium, Dirty

22. Water (a) Source: City, Spring, Dug well, Driven well. (b) In, out

23. Toilet (a) Type Fam. exc. use: Yes, No

(b) House, porch, yard, cellar (c) Persons using

24. Direct city sewer connection: (a) Sinks: Yes, No

(b) Toilet: Yes, No

INCOME. 25. Annual earnings (a) Father, $

(b) Mother, $ (c) Other income, $ (d) Total, $

MONTHLY RENTAL. 26. Amount, $ Own, free

Figure 4. Schedule used in infant mortality investigation at

MOTHER. 27. Nationality

28. Age 29. Marriage ages duration years

30. Sp. Eng.: Yes, No 31. Rd. and Wr.: Yes, No

32. Yrs. U. S.

33. Pregnancies (a) Losses

	Mother's age	Year of—	Period	Cause	Age at Death
1st					
2d					
3d					
4th					
5th					
6th					
7th					
8th					
9th					
10th					
11th					
12th					
13th					
14th					
15th					

34. Record of employments Age

1		
2		
3		
4		
5		
6		
7		
8		

35. Work (a) Yr. before conf.
(b) Yr. after conf.
(c) Ceased before (d) Resumed after

36. From baby ac. work from mo. to mo.
(a) Reg., Irreg. (b) Extent
(c) Caretaker: Relation Age

37. Usual home duties: Servant No servant Occa. help
(a) Ceased part of duties before (b) All before
(c) Resumed part of duties after (d) All after

BABY

Name

Born at

MOTHER

Name

Address

FATHER

Name

Address

Saginaw, Michigan, by U. S. Children's Bureau.

whose births in that area had not been recorded are discovered. In the Johnstown investigation it was found that many births to Serbian mothers had escaped registration. Accordingly birth records were supplemented by baptismal records of the Serbian church and a canvass then made of the principal Serbian quarter of the city. Mothers visited were always asked if they knew of other babies in the neighborhood. Unrecorded births were found from data on death certificates, lists of births that occurred in hospitals, and from baptismal records of different churches. A total of 147 unregistered births were found for the city of Saginaw, Michigan, in 1913.

Justification of this intensive method of study by field work investigation is found in its results. From the study of infant mortality in Saginaw, Michigan, for the calendar year ending November 30, 1913, a rate of 84.6 was obtained as compared with a gross recorded rate of 137.9. This result was had from a field work study of 1,015 births selected according to the method just described and occurring in a population of 53,161, living in a city of diversified industrial life with 23.3 per cent. foreign born.

The field work investigations described in this chapter by no means exhaust the variety in technique exhibited in social inquiries, nor do they constitute specific examples of the three special techniques of field work (case work, sampling, and complete enumeration), but they do illustrate

field work procedure and organization at its best in different parts of the field of social investigation, and thus suggest to the research student methods which have actually been tried out with success.

Bowley [26] gives four possible sources of error in the investigation of social conditions: (1) the information obtained may be incorrect; (2) definitions and standards used may be loose, unsuitable, or wrongly conceived; (3) households visited may not contain a fair sample of the whole population; and (4) possibilities of error arising from the process of estimating the whole by measuring a part. These difficulties and others will be treated in the remaining chapters of the book describing respectively, case work, sampling, complete enumeration, schedules and editing.

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CHAPTER IV

THE INVESTIGATIVE PROCEDURE OF CASE WORK

Of the three techniques of field work in social science—case work, sampling, and complete enumeration—the first mentioned deals with the individual or the family in its social relationships. Where the latter two techniques of field work investigation deal with a larger or a smaller *group* of individuals, case work supplies a technique for an intensive and many-sided study of the *individual.* Social case workers use the term "case work" to embrace more than the investigative procedure of studying individuals; they mean by case work a process which includes besides investigation, diagnosis of social situation, and treatment. In this chapter the term case work is used in the restricted sense first mentioned, that is, we shall describe the principles of the investigative procedure of case work. Again, we are not limiting our description to investigation in "social case work," but enlarging it to include the special variations in the field work technique of clinical criminology and epidemiology.

THE UNDERLYING LOGIC OF PROCEDURE

Let us first examine the underlying logic of the procedure used by the social worker in his investigation of a client. Intelligent treatment of human beings in misfortune rests on a social diagnosis which takes account of the needs, resources and possibilities of each case. The plan of treatment depends upon the collection of evidence and the drawing of inferences therefrom. The social worker gathers this evidence from the client, from his family, and from sources of insight outside the family group. By comparing evidence collected from these sources it becomes possible to draw inferences and intelligently to plan treatment. But it is testimonial evidence that the social worker gathers from his field investigation. The evidence that is significant for diagnosis and social treatment is *social* evidence,—or the succession of petty acts, trifling remarks, or innumerable decisions which, in themselves and viewed independently appear to be insignificant, but which have important cumulative effect. Thus social evidence, although it does not consist of conspicuous acts is nevertheless, indicative of a trend of behavior. It is made up as Miss Richmond says, of "all the facts as to personal or family history which, taken together, indicate the nature of a given client's social difficulties and the means to their solution." [27] In the facts composing these

[27] Richmond, Mary E.—*Social Diagnosis*, 1917, p. 50.

"stream pictures" we find social evidence for diagnosis and treatment.

In considering social evidence it is important to distinguish the different types of evidence gathered. In the process of investigation the social case worker gathers evidence from witnesses rather than from trained observers. It is thus difficult to get *facts* which are ample as well as pertinent. When a thing can be affirmed with certainty we conclude that it is a fact. Things which have external reality are not more facts than the existence of ideas and images in the conscious or unconscious mind. Consequently although a fact is so often thought of as a tangible thing its definiteness consists not only in its objectivity, but also in its certainty, and in some cases in its verifiability. Evidence, or the ultimate fact or facts, offered as a basis for inferences (reasoning from one fact to another) is naturally of different kinds. For our purposes, the distinctions between real, testimonial and circumstantial evidence are sufficient. Real evidence consists of facts had by first hand inspection. The visitor finds in the appearance of a client's home real evidence as to the conditions under which he lives. But the report of these observations to a supervisor becomes to the latter, testimonial evidence. This form of evidence consists then in the assertions of human beings. It may be further analyzed into an assertion, not of direct observation by the visitor, but of what

others told him—this is hearsay evidence. It is the weakest form of testimonial evidence and should be used with caution. Passing on now from direct assertions by human beings, which if true would establish the point at issue, we come to indirect or circumstantial evidence, a catch-all which includes everything that is not the direct assertion of a human being. Circumstantial evidence, although usually rated as of lower value in independent cases, gains cumulative effect by adding item to item and has the advantage of not depending for its weight upon the elusive personal trustworthiness of a witness.

The value of a witness's testimony depends upon his competence and his bias. The witness's opportunity to know the facts and his use of them is influenced by his attention at the time, his memory and his suggestibility. At the time he may not have thought the incident important and hence not given it close attention, or on the contrary, the incident may have called up former associations and hence received undue weight. The case worker must consider the "funded thought" of the individual, the sum total of his traditions and mental associations. Evidence about mental abnormalities is not likely to be obtained from uneducated people by asking them questions about "peculiarities." Such familiar terms as laziness, temper and crankiness, will have more meaning to them. Faulty memory of an event may be due as much to the possession of but a scanty

vocabulary in which to express oneself, as to malobservation and errors in memory. The witness may be suggestible, that is, over-ready to yield assent to and to reproduce the assertions of other people. Upon these considerations the competence of the witness depends. Leading questions should be avoided for, as Miss Richmond says, "The social worker must be on guard against getting back as alleged fact some mere conjecture of his own which he has implicitly expressed by his wording, or by the inflection of his voice."

Certain kinds of bias are especially to be heeded by the social worker. There is the racial or national bias of the witness. Immigrants of South Italian descent have come from primitive rural communities where life conditions were simple, where parish jealousies were strong, and where courts were generally distrusted. They are nevertheless a proud and spirited race resenting any assumption of superiority, and regarding with repugnance direct questions or evidences of brusqueness. Yet they are quite approachable when the procedure is leisurely and indirect. Variations in education and environment are also responsible for bias. There is also the bias of self-esteem and of collective self-esteem which appear as family pride.

Not only does the case worker run a risk of using incompetent or biased testimony, he also encounters sources of error in the process of rea-

soning from testimony. Inferences need to be corroborated by gathering as much evidence as possible. Ingenuity in making one working hypothesis and then another and patience in testing them may be the only way to supplement meager evidence. There are risks that arise from the process of thinking and from the state of mind of the thinker. It is a mistake to place much reliance on "general rules," since human conduct is too complex to be interpreted by rules of universal application. Particular cases assumed to come under the general rule often can not be so disposed of. There are dangers in analogical reasoning which the social worker should guard against in making inferences. The resemblance between two cases may be quite superficial at the points under consideration—the crucial ones—while in other respects the likeness is so marked that it is misleading.

Mistakes are often made in inferring about causal relations. It is common to confuse association with causation, and it is a native tendency of the human mind to seek one cause, and having found one apparently satisfactory explanation, to fail to go beyond it. In human conduct, where motives are involved, we never find one single simple cause, but must train ourselves to expect a complex and multiple cause. Not only should the mistakes in the process of thinking, just recounted be guarded against, but the social worker should avoid the dangers to valid inferences which arise

from his own predispositions, from the special assumptions of his particular branch of work, and should take pains to collect with impartiality the evidence upon which he bases his decisions.

From this brief sketch of the logical principles which underly the procedure of case work we may turn to a description of the field work of investigation. Four processes are involved: (1) the first interview with a client, (2) the early contacts with his immediate family, (3) the search for further insight and for sources of needed cooperation outside his immediate family, and (4) the careful weighing in their relation to one another of the separate items of evidence thus gathered and their interpretation.[28]

THE FIRST INTERVIEW

Miss Richmond summarizes the procedure of the first step as follows:

"The first interview should (a) give a fair and patient hearing; (b) seek to establish a good mutual understanding; (c) aim to secure clues to further sources of insight and coöperation; (d) develop self-help and self-reliance within the client's range of endeavor.

"The interview must not be hurried, therefore; it must be held in private, and with every consideration for the feelings of the one interviewed, though always with a definite goal in view.

"Many questions have been answered before

[28] *Ibid.*, p. 103.

they are asked; these need not be asked by a good listener. Necessary questions should be so framed as to make truth-telling easy. Questions that can be better answered by some one else are not necessary ones.

"The clues most frequently needed from the initial interview are (a) relatives, (b) doctors and health agencies, (c) schools, (d) employers, past and present, (e) previous residences and neighborhoods.

"The client's own hopes, plans, and attitude toward life are more important than any single item of information.

"Note-taking during the interview is often not wise, though this depends upon the nature of the request and upon the place of the interview. . . .[29]

"The last five or ten minutes of the interview should emphasize the interviewer's desire to be helpful, and prepare the way still further for future intercourse.

"There are many circumstances that may modify the method of a first interview. Among these are:

"(a) The nature of the task about to be undertaken, whether probation work, family work, protection from cruelty, etc.

"(b) The origin of the application or request for service; whether from an agency or individual already interested, or from an applicant on his own behalf.

[29] *Ibid.*, pp. 132–3, order slightly changed in quoting.

"(c) The place of the interview, whether in the client's own home or at the social agency's office.

"(d) The recorded experience available. Any possible previous record in the agency's files concerning either the person applying or others of his family. (Search should be made for such a record before the First Interview and again after its close.) Any possible previous records of other social organizations that show relations with the person applying. (Where there is a confidential exchange, it should be consulted for this information both before the First Interview and after.)"

There are many instances in which failure to inform himself about the client's family history is responsible for lack of full success in treatment. Investigation should proceed on the premise that every individual is a member of a family group. The family has a history of its own quite as much as the individuals who compose it. A conception of "the main drift" of the family life is very important and comes from a knowledge of the family history. That very real family asset cohesion or unity, is closely related to such intangible things as the capacity for affection, for admiration, for energetic endeavor, for enjoyment and for social development which its members possess.

SOURCES OUTSIDE THE FAMILY

When the case worker has secured satisfactory information as a result of the first interview and

from other early contacts with the family, it becomes necessary to "break through the narrow circle of the client's own view of his situation" and investigate sources of information outside the family. Miss Richmond found that 56 social agencies of 19 different types located in three cities, consulted outside sources 10,871 times, counting in any one case only the first consultation with the source used. These consultations grew out of the investigation of 2,800 cases. The groups of outside sources frequently used by investigators of these agencies were, other social agencies, churches, doctors and health agencies, former and present neighbors, relatives, former and present employers, schools, friends, and public records. The order in which these sources were consulted differed in different cases; in one case the order relatives, physicians, police, hospitals, former employers, and so on was followed; in another case the order, relatives, teachers, present neighbors, present landlords, former landlords, friends, former employers and so on throughout the list of 20 outside sources was followed; and finally, in the third city the order, present neighbors, friends, physicians, relatives, present landlords, former employers, and so on was followed.

A study of the order in which outside sources were consulted, led to the formulation of certain principles which may govern choice in deciding

the order of approach. Miss Richmond[30] has stated these principles thus:

"(1) Strike out boldly for history.

"(2) Seek first those sources that are likely to be rich in history only and seek later those most likely to be rich also in coöperation.

"(3) Seek out witnesses who have been able to make first-hand observations in preference to those whose information is second-hand.

"(4) Recognize the special value of supplementary clues—of clues, that is, to sources of information not revealed in the first interview or in subsequent ones with the family group, but which come to light in the course of inquiry.

"(5) Think of sources in groups, and tap each group for a new set of experiences."

Relatives are listed among the first sources to be visited in investigating sources of insight outside of the family group. Relatives, including all persons related to the client whether by birth, marriage or descent, have certain failings as witnesses which the social worker should not fail to remember. Their evidence is often prejudiced, they frequently assume that they know more than they really do, and they usually lack understanding of a social situation and of social values. On the other hand they are in a position to contribute valuable evidence as to individual and family history, they often have unusual insight into the sit-

[30] *Ibid.*, p. 179.

uation, and may be relied upon for support and cooperation. It should also be remembered that whenever they have tried to do their duty towards the client, they have a moral right to be consulted in any plans that are being made for his welfare.

Medical sources are often in a position to supply very valuable evidence because unprejudiced and scientific in their attitude. Miss Richmond summarizes the procedure of the social worker in gathering data about his client from doctors, hospitals and medical sources as follows:

"(1) Ask for prognosis as well as diagnosis, for the probable duration and outcome of the disease, and for ways of helping to hasten recovery and avoid recurrence.

"(2) Economize medical resources, by selecting the best sources and using them to the full.

"(3) Seek first-hand information, and not depend upon hearsay statements of 'what the doctor said.'

"(4) Note the date of a medical diagnosis before making it the basis of action.

"(5) Beware the medical opinions of the non-medical.

"(6) Seek the mediation of a physician in securing important medical information not otherwise procurable.

"(7) Report with special care the social side of medical cases."

Evidence from teachers and school sources is incomplete because of the present organization of

the educational system which fails to individualize pupils. Testimony of employers and other work sources has certain failings because of its limited nature. Whatever bias there is in evidence from this source is lessened by consulting former employers rather than present employers. This last observation applies to evidence from neighborhood sources also. In general, former neighbors and former landlords are more reliable witnesses than present neighbors and present landlords, for as Miss Richmond says, "Neighborhood evidence is often the synonym for gossip and inaccuracy."

Besides the testimony of witnesses, relatives, doctors, teachers, employers, neighbors or landlords, the social worker in his investigation of the client must often consult documentary sources. In chapter ii we have outlined in some detail the principles which should govern the critical use of documentary sources, but it is necessary to supplement at this point by describing the chief documentary sources consulted by the field worker in investigating a client. Miss Richmond says [31]:

"Social workers consult documents most frequently for facts about birth, death, marriage, divorce, whereabouts, property, immigration, and conduct.

"Many documents are utilized in establishing dates of birth, such as certificates of birth, baptismal certificates, immigration records, naturalization papers, insurance policies, Bible and other

[31] *Ibid.*, p. 272.

religious records, court records, hospital records, children's institution records, and the records of other social agencies. Not all of these are of equal value. The record made at or near the time of birth is the most trustworthy.

"The chief sources for proof and for date of death are the records of the board of health and hospitals.

"The sources of proof and for date of marriage are the records of marriage licenses and marriages (civil) and of marriage ceremonies (church). There are often minor differences of date, such as differences between the date of issuing the license, the date of the ceremony, and the date of reporting the ceremony.

"Records of birth, death, marriage, property, etc., often reveal the whereabouts not only of members of the immediate family but of friends and connections. Other sources for whereabouts are directories, voting lists, enlistment records, police precinct books, receipts of foreign drafts, and cemetery records.

"The most useful and accessible source of all is the directories, both special and general, for current and earlier years. Boards of trade, certain large manufacturers, the publishers of directories, and a few large libraries have files of the directories of other cities. Every case worker should learn to consult directories promptly and skilfully.

"Property data appear in records of real estate, inheritance, insurance, bank deposits, pensions, and cemetery lots."

The foregoing description of the investigative procedure of general social case work is all too brief, but it will serve to provide the student with a knowledge of the high points at least in this special technique of field work. A more comprehensive and complete treatment of case work will be found in the references listed at the end of the chapter.

RECORD WRITING

In our treatment of the technique of case work investigations we have thus far touched only upon the procedure to be used in approaching a client, in discovering and utilizing sources of information and have not described the methods of recording these observations and this information. If the records of observations made by the social case worker are to be scientific, they must be impartial and impersonal. Wherever precise terms of medical diagnosis obtained from the physician or psychiatrist can be secured, they should be used instead of the general terms of the popular vocabulary. In this way objectivity may be written into some statements on the case record. Qualitative terms of "good," "fair" and "bad" degrees of a characteristic, should be discarded wherever more precise psychological terms or

quantitative terms can be used to describe the trait or condition. Miss Ralph [32] has summarized the practical principles of record writing for case workers engaged in child-helping work as follows:

"1. The observations of an investigator and the statements of persons interviewed should be recorded as soon as possible after the visit or interview.

"2. Care should be taken to have the proper names in the records correctly spelled.

"3. All records should be carefully dated, and if a record is continuous, each new entry should be dated.

"4. In recording an interview, always give the date, the full name and address of the person interviewed, his relationship or connection with the child or family, important details of the interview, and the name of the visitor.

"5. The use of terms which express judgments, such as 'good,' 'bad,' 'doing well,' etc., and of indefinite terms such as 'incorrigible,' 'immoral,' 'laborer,' etc., should be avoided.

"6. If information has not been secured on any point, state why the facts are not given.

"7. Under points relating to relatives, references, membership in organizations, and so on, the full name and address of the person or organization should be given.

"8. Points requiring special or expert knowl-

[32] Ralph, Georgia G.—*Elements of Record Keeping for Child-Helping Organizations*, 1915, pp. 112–124.

edge to determine should be answered in a way that will leave no doubt as to the source of the information.

"9. A detailed account of investigations should be written up in addition to answering the questions covered by the record form.

"10. Records of all children in care should be reviewed periodically and a summary of important developments in each case should be made.

"11. Records should be kept up to date."

EXAMPLES OF MEDICAL-SOCIAL CASE INVESTIGATION

Before concluding our account of case work investigation as a special technique of field work it will be worth while to consider briefly two examples of special forms of investigating individuals in their social relations—clinical criminology and the field work of epidemiology.

The diagnosis of conduct and behavior disorders is difficult to make. Yet Dr. William Healy has made an important contribution to the technique of clinical criminology, and, incidentally, to case work investigation technique in his thorough and painstaking studies of juvenile delinquent careers. The desirable facts for diagnosis are classified by Healy under eight headings.[33]

(1) Family history. This heading includes those facts that have to do with race, marital conditions and the work history of the offender's parents; the number of births in the family, an ac-

[33] Healy, William.—*The Individual Delinquent*, pp. 53–65.

count of miscarriages and causes of any deaths in infancy; the parents' habits in the use of drugs alcohol and tobacco. Besides these facts information about specific diseases or defects of the father and mother, with particular reference to those which may have debilitated the germ plasm or affected the embryo, and not omitting hereditary diseases. Besides mental and physical defects and characteristics of brothers and sisters and in ancestral side-lines, the facts as to mental aberrations, defects and peculiarities on the part of forebears are very important. Any court or institutional record in the family should be ascertained and made note of.

(2) Developmental history. Under this heading fall the facts which supply a full account of the growth, constitution and early habits of the offender during infancy and childhood. The question of possible injury through an accident to the mother during pregnancy should be investigated, also such facts as would show what the antenatal conditions of health, hygiene and occupation of the mother were during pregnancy. Nutritional disturbances or convulsions in infancy should be studied. It is also important to know at what age the offender learned to creep, walk, run, teeth talk, and go to school. Evidence of adolescent instabilities or peculiarities whether mental or physical deserves careful attention. Among other inquiries to be made are questions about somnambulism and night terrors.

(3) Environment is a heading that hardly needs amplification. It covers family control as well as the more obvious factors of the outside world.

(4) Mental and moral development. This includes some of the less obvious and more subtle factors of the individual's life. School history in detail is important to study. Such matters as associations with the opposite sex, general behavior, the development of special talents and other observable mental traits.

(5) Anthropometry. Although anthropological measurements are not all helpful, such facts as the time of appearance of menstruation and of hair on the face and on the pubes; the degree of development of the breasts; time and peculiarity of growth of the various teeth; and the study of growth curves of height and weight; are all important in their bearing on glandular functions and disturbances.

(6) Medical examination with special reference to neurologic and psychiatric aspects of the physical functioning and peculiarities of the offender. In this connection special attention is paid to convulsions, epilepsy, petit mal, sexual habits and diseases, alcoholism, excessive use of tobacco, drug habits and sleep. The mental factors of attention, memory, judgment, physical and mental control, and association processes. Under this heading also comes the examination of cranial nerves, of sensory and motor reactions, and of reflexes.

(7) Psychological examination including mental testing and psycho-analysis constitutes the seventh main inquiry. Tests of intelligence age and tests of performance should be given. More searching examination is given to reveal hidden mental worries and conflicts, recurrent imageries and mental attitudes, half-forgotten mental experiences, many of which underlie misconduct.

(8) The delinquent career constitutes the eighth heading. Here is described the anti-social act, the cause of the delinquency as given by relatives and friends, and the attitude of the offender toward the court, probation officer and the institution.

Obviously this intensive study of the individual can only be carried through by a physician with psychiatric training, or by a psychiatrist, and the average social worker or investigator is wholly unprepared to conduct such a study. Yet a description of some of the main points in this technique of case study is useful because it serves to emphasize the intensive character of investigations of individuals.

The second example of case study (aside from social case work investigation) is also taken from the medical field. Modern sanitarians have developed a procedure for investigating the sources of an epidemic by field work study. The routes of infection may be classified into two groups: public, including water, milk, flies, and food; and private, including contact with discharges of in-

fected individuals from the nose, throat, bladder and bowel. The old era of "general sanitation" by blanket measures is passed and today the epidemiologist gathers sociological data and goes directly to the guilty source of the epidemic by using a special technique of field work. Case work investigation in the study of the sources of an epidemic involves visits to persons already ill with the disease. The procedure of this bedside inquiry is as follows:

(1) The epidemiologist obtains the names and addresses of patients from the local health officer, attending physicians, or from lay citizens; he then

(2) makes bedside visits to all or a majority of patients and having decided that the patient has typhoid, asks these questions:

(a) "When did you show the earliest symptoms of the disease? Why?" When this date is fixed, the date at which the infection entered the patient's mouth is fixed, i. e., a date usually between one and three weeks previous to the date of earliest symptoms. The investigator at this stage of his inquiry does not know which of the usual factors, water, milk, food, flies, or fingers is involved, and still less which particular water, milk, food route is the guilty one. But the answer to this question reduces the possible routes to those used by this patient—not at any time —but during a specific period, i. e., from one to three weeks preceding the date of his earliest symptoms.

(b) The second question is, "Where were you during that period? Why?" Because if the patient was not in the community during that period, he could not have contracted his infe-

tion within it, and does not belong to the outbreak under examination at all but to some other. He is an "imported" case and is of no assistance in locating the source of the main outbreak—unless perchance he be himself that source, the introducer to the community of the original infection. If he be an imported case he is noted for further reference, but the investigator goes on to another.

(c) "Were you associated during your period of infection with any then known typhoid cases? Why?" Because such association, especially if intimate, makes it more than probable that the case under examination received his infection from the preceding case, rather than from any general route and that he is therefore a "secondary" case. If he had such associations, this is noted for further reference and the investigator passes on to another bed-side. If not, the questions continue and now at last take up milk, water, food, etc., but of course only so far as to determine those used by the patient during his infection period.

(3) The investigator then passes on to the next patient. Thus far he has not learned much, but he has narrowed the possible routes of infection to certain water supplies, certain milk supplies, certain food supplies, etc., i. e., those used by the first patient during a certain period. At the bedside of the second patient, the same inquiries in the same order are made. If this case be a primary case (not imported) the origins of his drinking water, milk, food, etc., during his infection period are also ascertained. It is more than likely that dissimilarities between the two case histories have developed upon investigation. Now since the responsible water supply, milk supply, etc., must be one of those water supplies, milk supplies, etc., used

in common by primary cases all those not common to both these primary cases may be dropped from consideration. If their water supplies are different, water is eliminated; if milk supplies differ, milk is eliminated; and so on through all the common routes.

The investigator having determined the guilty route, goes directly to this route and quickly confirms the indications of his results.

(4) The investigator makes observations of certain environmental factors in addition to the careful case analysis just described.

(a) If it is summer he notes the presence and absence of open toilets in the back yards, of manure piles and of garbage cans—all of which data bear upon fly infection. If it is winter time, or if the community is well provided with sewers, he does not even consider flies.

(b) If the cases are grouped in one quarter of the town, while the water supply extends all over it, he tentatively eliminates the water supply, before he asks a question. If good surface drainage and sandy soil exist, or driven wells are chiefly in vogue, he tentatively eliminates well water.[34]

The field work technique of case investigation is one of the most highly developed techniques of field work in social science. The foregoing account has shown how the individual is the unit of such study and the student has obtained an appreciation of the intensive character of this type of field work investigation. Before passing on to a

[34] Dr. H. W. Hill, in an article, "The Detailed Procedures to be Followed in an Epidemiological Determination of the Origin of a Typhoid Outbreak," pp. 234–237, *Fourth Biennial Report, State Board of Health of Minnesota*, 1911–12—printed in 1914.

description of the special field work techniques of sampling and complete enumeration in the two following chapters, let us summarize the chief elements in the investigative procedure of case work study.

(1) Field work begins with the first interview, which aims to
  (a) establish a good mutual understanding, and
  (b) to secure clues to further sources of insight outside the family circle,
  (c) such clues as relatives, doctors and health agencies, schools, employers and previous residences and neighborhoods.

(2) Sources of information outside the family group are next investigated.
  (a) The order in which these sources should be approached is governed by principles that sources rich in history, those likely to supply information based on first-hand observations, those likely to furnish supplementary clues, and those forming groups of sources, should in general, be first consulted in the order given.
  (b) Twenty sources most used by agencies in three cities and doing social case work were:
    1—Relatives
    2—Police
    3—Physicians
    4—Teachers
    5—Former employers
    6—Clergymen
    7—Friends
    8—Birth records
    9—Present neighbors
    10—Courts
    11—Hospitals and sanatoria
    12—Marriage records
    13—Former neighbors

14—Former landlords
15—Present employers
16—Health departments
17—Lawyers
18—Present landlords
19—Nurses
20—Medical—social service departments.

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CHAPTER V

SAMPLES THAT ARE REPRESENTATIVE—THE PARTIAL CANVASS—INVESTIGATIVE PROCEDURE OF THE SOCIAL SURVEY

In the scientific study of the group as distinguished from the individual, two techniques of field work have been developed, that of sampling, and that of complete enumeration. It is not always necessary in an investigation of a given social problem to study every individual in the population concerned. Such an exhaustive analysis is very expensive and time consuming. Consequently wherever it is possible to satisfy the conditions of the investigation by the study of some part less than the whole such a procedure should be followed. Investigators of social and industrial conditions have developed a technique of partial canvass which has been used in a great number of social surveys of social communities and neighborhoods, as well as in the study of specific social problems. The scientific basis of partial canvass as used in the social survey is found in the theory and practice of random and representative sampling. Before entering into an ex-

position of the theory of sampling let us consider some examples of survey methods.

THE SOCIAL SURVEY

The Pittsburgh Survey stands as one of the most scientific in method and thorough-going for its scope, of any surveys conducted in the United States. In 1907 a quick diagnosis of about twenty phases of life and labor in the steel district was made on the basis of standards worked out elsewhere. By bringing these diagnoses together for comparative study, something of the structural relation of the problems was set forth. In five or six fields intensive investigations were conducted by experienced investigators. An illustration of the technique followed in one of these studies will be given later on in this chapter. The general results of this survey and the consequences following upon the publication of its findings are too well known to need mention here.[35]

Before the field work of survey begins, considerable organizing of helpful and interested community forces and agencies must be concluded. The surveys conducted by the Department of Surveys and Exhibits of the Russell Sage Foundation of the cities of Syracuse, New York, and Spring-

[35] "Women and the Trades," by Elizabeth Beardsley Butler; "Work-Accidents and the Law," by Crystal Eastman; "The Steel Workers," by John A. Fitch; "Homestead: The Households of a Mill Town," by Margaret F. Byington; "The Pittsburgh District," Symposium by John R. Commons, Robert A. Woods, Florence Kelley, Charles Mulford Robinson and others; "Pittsburgh: The Gist of the Survey," by Paul U. Kellogg.

field, Illinois, will serve as examples of how the ground is prepared for study.

SURVEY OF SYRACUSE, NEW YORK

In 1911 several leading citizens of Syracuse became convinced that the rapid growth of the city had created situations and conditions which needed study. It seemed desirable to gather sufficient data on those points which appeared to call for immediate action, and to supplement this measure by a general survey of conditions in order to determine in what lines more intensive investigations were needed.

Strong local backing for the survey was obtained by gaining the support of four large organizations in the city which themselves were federations of other organizations. The Ministerial Association included over one hundred churches; the Chamber of Commerce represented employers and industrial and commercial organizations; the Central Trades Assembly represented all the labor unions of the city; and the Associated Charities represented many of the relief agencies; these organizations contributed funds and support to the enterprise through a central survey committee of twelve. It was planned to make a preliminary stock-taking in five weeks. For this purpose an experienced investigator from the Russell Sage Foundation was employed. Documentary material of assistance to the director such as—city and county reports for a number of

years back; special reports published by the chamber of commerce, the board of education, the academy of medicine and other organizations; population figures; maps; city ordinances, etc.; was gathered by several sub-committees. On his arrival the director consulted with the members of the central committee and in order that he might "become saturated with the main facts of the community" he held numerous interviews with city officials, business men, labor leaders, clergymen, teachers, social workers, physicians and others familiar with the social conditions of the city.

These consultations led to a definition of the main lines which the inquiry should pursue:[36]

(1) Health conservation and sanitation.
(2) Housing conditions among unskilled workers.
(3) The betterment agencies of the city.
(4) Foreign population.
(5) Juvenile delinquency.
(6) Civic improvement.
(7) Labor conditions.

Since it was obviously impossible for the director to investigate all of these complex problems in the remaining four weeks of his term of service, several state and national welfare organizations were requested to conduct inquiries in these fields.

[36] Harrison, S. R.—"A Social Survey of a Typical American City," *The Proceedings of the American Academy of Political Science*, vol. II, No. 4, July, 1912, pp. 18–31.

It was felt that the survey would gain through their coöperation by being able to do extensive work on a more comprehensive scale, and that these organizations would themselves gain by the coöperation and backing of the local survey organization whenever they were able to begin their work. The following organizations promptly responded to this invitation: The New York Child Committee, the North American Civic League for Immigrants, the National Housing Association, the National Consumer's League, and the National Prison Committee. In addition to this outside coöperation some twenty local people gave their services voluntarily as their personal contribution to the survey; a young physician made a study of the city's vital statistics; a young rabbi prepared the statement of playground equipment and needs; the secretary of the associated charities took charge of the housing investigation; an official of the city sewage commission prepared a summary of the sewerage situation; local probation officers studied juvenile delinquency; a lawyer gathered data on relief work; students in a sociology class at the university aided in the investigation of child labor and in street trades; and others made maps and charts and assisted in various ways.

Outlines of data to be gathered by different investigators were made out by the field workers and the director of the survey. A wide enough range of facts were covered in these work-pro-

grams to allow the different investigators some range of choice in deciding, as they proceeded in the study, what matters should be given more intensive inquiry. The work-program on health and its conservation follows.[37]

I. Vital statistics.

a. General death-rates for 1907–08–09–10–11; and average death-rates for five-year periods running back twenty years; infant death-rates, same period.

b. Distribution of death by wards, for 1910.

c. Population by age and sex in each ward, in 1910.

d. Deaths from more prevalent diseases for the last ten years, especially contagious and preventable diseases such as typhoid, tuberculosis, diarrhea, and enteritis (under one and under five years of age), and pneumonia.

e. Case rates of the disease more prevalent locally for the last ten years——especially contagious and preventable diseases, such as diphtheria, typhoid, measles, scarlet fever, tuberculosis.

f. Births: reporting of; still births; birth-rates compared with other cities of similar size and population make up.

II. Health administration.

a. Effect of administering health work through a subordinate bureau of the department of public safety, instead of through a department of health;

[37] *Ibid.*, pp. 21–22.

adequacy or inadequacy of health appropriations.

b. Educational work for health; and special needs; opportunities for increasing educational work as shown by work done in other cities.

c. Organized work against venereal diseases; its chief needs; work done by the Syracuse Society for the Prevention of Social Diseases.

d. Quarantine practice in less serious contagious diseases.

e. Medical inspection of schools; how adequate? In all schools? How financed?

III. Food inspection.

a. Meat, fruit, fish.

b. Screening from flies.

c. Milk supply; analysis of bacteriological count from January 1 to July 1, 1911; percentage of producers whose milk was above the maximum bacterial count; method of enforcing the milk rule; any licenses revoked; analysis of cream count; need of better publicity work on milk and cream scoring.

IV. Water supply.

a. Source of general supply; water sheds; cost.

b. Surface wells; springs.

V. Sewerage system.

a. Houses connected; open privy vaults not connected with sewers.

b. Location of sewer outlets.

VI. Garbage disposal.

a. Cost; method.
b. Location of plants.
c. Method of collection of garbage.

It was possible to complete this survey of Syracuse at a cost of $500 for the investigations, and $600 for the publicity work; but only on account of the careful organization before field work began of the numerous helpful and interested agencies and forces in the community.

SURVEY OF SPRINGFIELD, ILLINOIS

Dissatisfaction with social conditions in the city of Springfield, Illinois, led to a conference of public spirited citizens in 1914.[38] There was considerable diversity of opinion in regard to what the actual conditions were, but it was decided to give the various opinions the test of fact, consequently a survey committee of twenty-five representative persons was organized, including a state senator, a former lieutenant governor, a state commissioner, the city superintendent of schools, other public officials, business men, labor leaders, clergymen, doctors, women's club leaders, editors, teachers, and social workers. The Department of Surveys and Exhibits of the Russell Sage Foundation was asked to assume charge of the planning and direction of the survey. Through the efforts of this department the assistance and services of

[38] Harrison, S. M.—"Community Action Through Surveys," pamphlet of Russell Sage Foundation, 1916, p. 12.

six other departments of the Foundation were secured, as well as that of five national organizations, five state organizations, the coöperation of the social agencies of the city, and the assistance of over 600 volunteer workers in Springfield. The five national organizations were: The United States Public Health Service, American Association of Societies for Organizing Charity, National Association for the Study and Prevention of Tuberculosis, National Committee for Mental Hygiene, and the National Housing Association. The five state organizations were: Illinois State Board of Health, Illinois State Water Survey, Illinois Conference of Charities and Corrections, Illinois State Food Commission, and the State Department of Factory Inspection.

The main divisions of the survey were:

I. The Public schools.
II. Care of mental defectives, the insane and alcoholics.
III. Recreation.
IV. Housing.
V. Public health.
VI. The correctional system.
VII. Charities.
VIII. Industrial conditions.
IX. City and county administration.

Springfield is a representative American city.[39] It is a center for manufacturing, mining, agricul-

[39] *Ibid.*, pp. 16–18.

tural and commercial activities. It is the state capital. It is located about midway between the northern and southern states and near the center of population where the cross currents of social and economic life representing the different regional interests of the nation are all felt. It is a fairly representative of a large group of medium-sized cities in the country. For all these reasons the methods used in organizing and launching this survey are suggestive of procedure that may be used elsewhere.

METHODS OF SOCIAL SURVEYS

The general methodology of the social survey consists of five elements according to Paul U. Kellogg,[40] the director of the Pittsburgh Survey.

"(1) To bring a group of experts together to coöperate with local leaders in gauging the social needs of one city.

"(2) To study these needs in relation to each other, to the whole area of the city, and to the civic responsibilities of democracy.

"(3) To consider at the same time both civic and industrial conditions, and to consider them for the most part in their bearings upon the wage-earning population.

"(4) To reduce conditions to terms of household experience and human life.

"(5) To devise graphic methods for making

[40] "The Spread of the Survey Idea," *Proceedings of the Academy of Political Science*, vol. II, No. 4, July 1912, pp. 1–17.

these findings challenging, clear and unmistakable."

Since the subject of special interest to us is field work, we are not here concerned with topics (4) and (5), but anything that is suggestive and throws light upon preliminary procedure of organizing is of value in our study. Kellogg[40a] shows how the survey method may be regarded as a combined product of the contributions of the surveyor, the physician, the engineer, the case worker and the journalist. The unit of work for the social survey is taken from the surveyor since at the basis of the investigation lies an element of locality, or neighborhood or city, or of state or region. From the physician the social investigator takes the art of applying to the problems at hand, standards and experiences worked out elsewhere. The social surveyor should know at the start what good ventilation is and what cellar dwellings are. The conception of the structural relation of things is taken from the engineer. Labor conditions are not to be separated from housing, nor housing from sanitation. From the charity organization society the social surveyor takes the case work method of bringing problems down to human terms. It is the case work method of intensive study and the accumulation of "piled up actualities" that distinguishes the true survey from mere social prospecting. The method of graphic portrayal is taken from the

[40a] *Ibid.*, pp. 3–6.

journalist and supplies the special technique of publicity.

To sum up the methodology of the social survey as far as the field work phase of the study is concerned. We have seen from our account of the Syracuse and Springfield surveys how important was the preliminary organization. The usual procedure is to get together a central committee representative of all the helpful and coöperative interests in the local community. An outside expert in survey work is then employed to plan and direct the investigation. This director usually finds it helpful to secure the coöperation of several state and national welfare organizations in carrying out the undertaking. A quick size-up of the local situation is then made by the directing expert. This preliminary stock-taking usually brings to the surface conditions of chronic as well as acute social maladjustment and points the way to further intensive study in special fields.

As distinguished from this rapid survey method in which the entire situation is scanned, is the alternative line of action in which some unit less than the whole, such for example as a certain neighborhood, a city block or a specific problem like recreation or public health, is studied. Buffalo took a survey of its Polish district. Workers in social settlements have frequently surveyed their neighborhoods.[41] Block studies have been made by

[41] Woods, R. A. *et al.*—*Americans in the Process, North and West Ends, Boston*, 1902; St. John, G. B.—*Community Survey of 21st Ward, Chicago*, 1913.

Jones and Woolston in New York City.[42] Surveys of specific local problems have been made by numerous cities.[43]

Miss Byington and Carol Aronovici have drawn up suggestive lists of questions for which answers should be found in the investigation of special problems.

Industrial study (Byington) [44]

1. Estimated number of men, women, children employed.
2. Estimate so far as possible the proportion of skilled workers in each occupation.
   (a) In factory work, are the establishments large, with extreme subdivision of the work; or are they so small that each worker is familiar with the whole process?
   (b) What method of training or apprenticeship is there? How long a period does it cover?
   (c) What is the maximum wage, the minimum, in each occupation? What proportion of the workers reach this maximum?
3. Is the labor casual or seasonal? In what months is the work steady? In which dull?
4. Are there trade unions; if so, what benefits do they give the sick or unemployed? Approximate proportion of employes who belong.
5. Are there other pension systems connected with any establishments in the industry?

[42] Jones, T. J.—"The Sociology of a New York City Block," in *Studies in History, Economics and Public Law* (Columbia Univ.) vol. 21, 1904; and Woolston, H. B.—"A Study of the Population of Manhattanville," vol. 35, 1909.

[43] Lindholm, S. G.—*Recreation Survey of Cincinnati*, Juvenile Protective Association, 1913; *Report of Survey of Department of Health* (Atlanta, Ga.) 1912.

[44] Byington, M. F.—*What Social Workers Should Know About Their Own Communities*, pamphlet, Russell Sage Foundation, 1912, pp. 18–19.

6. Are conditions of work sanitary and healthful? Are there special dangers such as unguarded machinery, dust or dampness? Do workers, especially women, have to work in a trying posture?

7. How many state factory inspectors are there; what are their powers?

8. What industries employ women?

9. For the main industries, classify women employed by age and nationality. What proportion do employed women form of total number of women of corresponding age in the population?

10. Consider the facts in question 2, especially for women.

11. Give the state law governing

(a) The number of hours a week women may be employed in factories; in stores.

(b) The hours that women may work at night.

(c) Industries in which women may be employed.

12. What industries give out work to be done in the home? What are the usual weekly earnings in each such occupation; under what conditions is the work done?

13. What proportion of women wage-earners board? What does a working girl have to pay for board?

Housing study (Aronovici) [45]

1. Is the locality a community of homes or of three or four more family houses and what is the number of each type?

2. What is the average proportion between rental and family income? (If this cannot be ascertained, the rental per tenement by number of rooms in some characteristic sections should be considered.)

3. Are the families crowded in small tenements and what is the extent of crowding? (Number of persons per room, crowding in bed rooms, etc.)

4. How frequently are roomers taken in to piece out rents?

[45] Aronovici, C.—*The Social Survey*, 1916, pp. 81–83.

5. Is the water supply in the homes of good quality and sufficient for the use of the families?

6. Is there a sewer system and is it connected with the dwellings in all parts of the city? If not, what is the number of dwellings not connected and the number of families with individuals affected?

7. What is the character of the toilets; are they located in apartments, cellars, halls, basements or yards, and are they connected with the sewer? (Secure facts concerning each.)

8. Are toilets used by one or more families each and to what extent is overcrowding in toilet use prevalent?

9. What types of toilet ventilation are prevalent?

10. To what extent are bathrooms provided in the poorer sections of the community?

11. Is household refuse removed by the city and what is the method and frequency of removal?

12. How frequent are windowless rooms in dwellings?

13. How frequently are rooms dark because of proximity of buildings, lighting through airshafts or narrow courts?

14. Are yards provided in tenements, and what are the prevailing sizes?

EXAMPLES OF REPRESENTATIVE SAMPLING

The foregoing description of survey methods has emphasized the phases of preliminary organization and scope of the investigation rather than the real scientific basis of survey study as it rests on the principles of sampling. It will be convenient to lead up to our discussion of the theory of random and representative sampling by examining a few instances of systematic effort to select a representative sample from the field of a certain social problem.

The Federal Children's Bureau selects repre-

sentative cities in the registration area for the study of infant mortality. Johnstown, Pa., Manchester, N. H., Brockton, Mass., Saginaw, Mich., New Bedford, Mass., Watertown, Conn., and Akron, Ohio, were chosen because they represented such elements as economic, industrial and social conditions invariably associated with infant mortality. The nationality factor in population was represented by the existence of Slavic, French Canadian, Lithuanian, German, Portuguese, and Italian elements. Industrial variety was represented by iron, steel, cotton textiles, shoe and brass manufactures. The cities were widely distributed over the registration area geographically.

In Miss Byington's study of Homestead, Pa., a sample group of 90 working-class families was investigated to determine the standard of living.[46] Different wage groups indicative of grades of skill were represented in the sample in about the same proportion that they existed in the whole working-class population. The range of wage groups, less than $12 a week, from $12 to $14.99 per week, from $15 to $19.99 per week, and those receiving $20 and over each week, was sufficient to include the wage-earning portion of the population as it then existed (1907). Racial elements in the town's population were represented in the sample by including within the group studied, the native born, the old time English-speaking immi-

[46] Byington, M. F.—*Op. cit.*, pp. 187–204.

grant of a generation ago, and the newcoming Slavs. Inferences drawn from the sample were conservative as regards the dark side of the living situation, because for each racial group the percentage of unskilled workers among the budget families was smaller than in the mill census, thus making the sample group somewhat above the bare average in skill and wages. Representation for the oft-neglected factor, intelligence in purchasing and skill in family management, was provided for by arranging to keep accounts for families unable to do so for themselves and visiting them daily or every other day for that purpose. In this way it was possible to get a sample that was fairly representative of economic status, racial make-up, and intelligent management.

Random sampling has also been used in social investigations. Bowley's studies of livelihood and poverty in the English towns of Northampton, Warrington, Reading and Stanley furnish an interesting example of this method.[47] These towns are fairly representative of English towns with a population ranging from 15,000 to 150,000. In Reading and Warrington a variety of industrial activity is represented, while in Northampton and in Stanley there are predominate industries, respectively boots and shoes, and coal mining. Field workers were directed to investigate a random sample of the population of these four towns

[47] Bowley, A. L., and Burnet-Hurst, A. R.—*Livelihood and Poverty*, 1915, pp. 12–14.

by visiting one working-class house in 23 at Northampton, one in 19 at Warrington, one in 17 at Stanley, and one in 21 at Reading.

To be consistent and logical the more scientific way is to number the whole lot individual by individual consecutively, and after writing down these numbers on cards, shuffle the cards and draw at random some of the cards and then examine the objects with corresponding number. In applying this method to social problems it is necessary at the outset to adopt a careful and exact definition of the group to be studied. Just what is meant by "working-class families" or "wage-earning families"? To cite Bowley,[48] "If, for example, we are examining the physical condition of school children, we should delimitate the area to be taken, enumerate all the schools in it, and find the number of children on the register of each; the group taken would then be co-extensive with 'registered school children.' In making the measurements we should have to take the children absent from school as well as present, if they happen to be chosen by the selective process used, as otherwise we should be taking the smaller group 'children present at school'; this might give an imperfect result, as the absent children might contain a large proportion of the physically unfit. In any case, the group described would not contain children removed from the district and especially treated in institutions."

[48] *Elementary Manual of Statistics*, 1910, pp. 57–58.

"The temptation is always to measure the obvious and easily accessible; but if we do this our sample is 'of the accessible,' not of the whole group. Thus budgets of working-class expenditure, which are published, are not typical of the working-class as a whole, but of that part of it which is intelligent enough to have some kind of a record and is willing to communicate private details. . . ."

In the 1891 census of Norway, instead of canvassing the entire state, a certain number of representative cities and country districts were chosen.[49] Further reduction of labor was attained by taking within these districts only persons of 17, 22, 27, etc., years of age out of the general population. Moreover, only persons whose names began with a certain letter of the alphabet were selected for study. In this way a fair sample was selected for investigation.

THE THEORY OF INDUCTIVE INFERENCE

The question which we require an answer to, is this: How can we generalize from a limited set of data about conditions in a whole population? It has been established by logicians[50] and mathematicians that we can judge the characteristics of a whole *probably and approximately* by an examination of fair samples of the whole. Fair samples are chosen at random when, individual draw-

[49] Cited by Bailey, W. B.—*Modern Social Conditions*, 1906, p. 17.

[50] Peirce, C. S.—*Op. cit.*, pp. 126–187.

ings are independent, and whenever any particular item has the same chance as any other item of being drawn. The method of random sampling is to run over the objects to be sampled, abstracting the attention from their peculiarities, and arresting ourselves from motives wholly unconnected with those peculiarities. The mechanical aids to practical procedure are: to number all objects in a lot and draw numbers by roulette, or draw from a bag; or to arrange the items in order of size, alphabetical order, or some such plan, and then to draw the 10th, 20th, 30th, item and so on.

The logical basis of generalizing from samples of a whole to characteristics of the whole is found in the inductive syllogism—

(1) S', S'', S''', etc., form a numerous set taken at random from among the M's;
(2) S', S'', S''', etc., are found to be—the proportion r of them,—P's;
(3) Hence, *probably and approximately* the same proportion r, of the M's are P's.

This syllogistic procedure is one which begins with cases, proceeds to noting results, and concludes with a rule. It is thus an inductive syllogism.

Now it can be mathematically demonstrated that there are more possible samples that agree with the constitution of the whole, than there are samples that disagree.[51] Picking two balls at random from a bag containing two red balls, a, b, and two

[51] Royce, J. *et al.*, *Encyclopedia of the Philosophical Sciences*, vol. I, pp. 78–92.

white balls, c, d, what is the most likely color of the pair drawn? The possible combinations of the two balls are six in all: a, b; a, c; a, d; b, c; b, d; and c, d; of which the pair a, b, are red; and c, d, are white. Thus out of six pairs, there are but two pairs of the same color to four pairs of mixed coloring, that is, of red and white. In other words, the chance of drawing a pair of different colors is twice that of drawing a pair of the same color. Hence the chances are greater that the sample will agree with the constitution of the whole (which was half red, half white balls), than that it will not agree. Consequently it is possible to generalize from a sample to characteristics of the whole.

THE THEORY AND PRACTICE OF RANDOM SAMPLING

Let us now consider the theory and practice of selecting random samples. Bowley in his study of livelihood and poverty in the four English towns cited, selects fair or random samples of working-class homes from the whole population of each town as follows: For each town a list of all houses (from directories for Northampton and Reading, and from assessment lists elsewhere) was obtained. Every 20th house was checked for study (without reference to anything except accidental order—alphabetical or by streets). The buildings so marked, other than shops, institutions, factories, etc., formed the sam-

ple. The field workers were instructed to omit no house, however difficult it might be to get the information from its tenants.

How adequate and fair is this sample of one in twenty? In a group of N things, $p \times N$ have some assigned character, and n out of N things are chosen as a random sample and examined. Then it is more likely (as just demonstrated) that the exact proportion $p \times n$ of the cases in the sample will have the characteristic question, than that any other proportion of the cases in the sample will possess this character. Moreover, small deviations from this proportion are more probable than large deviations.[52]

Consider an example. A sample 800 houses out of 16,000 houses in a town are investigated. Ten per cent. of the houses in the town are known to be four-roomed. Then ten per cent. of the sample 800 houses, or 80 houses, is the most probable number of four-roomed houses to be found in the sample (as a matter of fact such exactness will not be reached; probably in practice 75 or 85 houses will be found to be four-roomed).

This principle may be stated mathematically. It has been proven that it is just as likely as not —the odds are equal—that the number found in the sample will differ from pn by as much as,

$$\frac{2}{3}\sqrt{\mathrm{p\ (1—p)\ n}}$$ the probable error.

[52] Bowley, *op. cit.*, pp. 178–83.

Conversely (and this has great practical significance for us in the solution of our problem), it can be shown that (unless p is very small), if p′*n* examples are found in *n* trials, *it is as likely as not that the proportion in the whole group* will differ from p′ by as much as,

$$\frac{2}{3}\sqrt{\frac{[p'\ (1-p')]}{n}}$$

which is the probable error of the sample.

"When the probable error is established, the tables of probability show that the fact will differ from the forecast by three times this error only once in 25 experiments in the long run, and by four or five times this error so seldom that the chance of so great a deviation is negligible."

Bowley uses this formula to construct a table showing the probable error in the case of 800 houses and thus gets a guide to the Northampton, Reading and Warrington investigations.

Per cent. found in sample.	Probable error	
	n = 800	n = 200
5 per cent.	.5	1
10	.7	1.4
15	.84	1.7
20	.94	1.9
25	1.00	2.0
35	1.08	2.2
*	*	*
*	*	*

"Thus, for example, if in Reading 20 per cent. of the houses in the sample are found to be four-

roomed, we deduce that the number of four-roomed working-class houses in the borough is as likely as not to differ from 20 per cent. of all working-class houses by .94 per cent., i.e., as likely as not to be between 19.06 and 20.94, and is very unlikely to differ by (3 x .94) 2.8, and practically certain not to differ by (5 x .94) 4.7."

"Taking three times the probable error as a reasonable measure, we can say that when we find 5 per cent. in the sample, we may write 3½ to 6½ per cent. for the whole, for 10 per cent. we may write 8 to 12 per cent. for the whole, for 15 per cent. we may write 12½ to 17½ per cent., etc."

EMPIRICAL RULES FOR REPRESENTATIVE SAMPLING

The foregoing example of the theory and practice of random sampling will give the student an introduction to the scientific basis of sampling.

Let us now conclude our treatment of this special technique of field work, by summarizing in the form of empirical rules the procedure of selecting a random sample that shall be representative of a complex aggregate.

A. Empirical rules for sampling when the composition of the population to be studied is known.

1. *Composition of the sample*: the sample should include all the essential elements of the material to be studied. The essential elements are those elements in the composition of the material under investigation which give it its distinctive character. Example: in studies of standard of living by family budgets such elements as,

size of family, income, number of dependents, nationality, etc., are determining elements.

2. *Size of the sample is limited,*
   (1) The lower limit is the smallest number which includes all the essential elements, and
   (2) the upper limit is the largest number that can be efficiently handled.

3. *Procedure to follow in selecting the smallest sample that is nevertheless representative.*
   (1) Analyze the whole population into its essential elements;
   (2) Select at random a sub-sample to represent each essential element;
   (3) The actual size of each such sub-sample should be,
      (a) directly proportional to the magnitude of this element as a part of the whole (principle of relative size),
      (b) but should be large enough to represent the character and range of variation among all items of this particular class (principle of absolute size).

Let us take a hypothetical case in order to see how these rules apply. Suppose that we are to make a study of the standard of living of working-class families in a certain locality. To follow rule #3, (1), analysis shows that such factors as,

nationality,
income and wages,
ages of members of family,
number of dependents,
occupation of chief wage-earner, etc.,

are essential elements in determining the standard of living among working-class families which

have been made the subject of previous investigations. We must then select at random a sub-sample to represent each of these elements adequately. To begin with the nationality element first, we may find in the locality studied that there are,

5,000 American families
10,000 Irish families
25,000 Italian families
28,000 Polish families
32,000 Russian families

100,000 Working-class families

Then the Italian sub-sample for nationality should be 25 per cent. of the whole sample, since Italian families are 25 per cent. of the whole population. Similarly for the sub-samples of other nationalities or racial groups. In this way we secure a notion of the *relative* magnitudes of the sub-samples for the element of nationality or racial make-up.

But how many Italian families must we have in order that the sub-sample of Italian families may be representative of the character and range in the standard of living for this group? We should make this sub-sample numerically large enough to show the range of variation in the factors other than nationality or racial make-up (which is the constant factor in this sub-sample), for example, the true range of variation in income, size of family, etc., among the Italians. By this procedure we determine the actual or *absolute* size of this

particular sub-sample (as distinguished from its mere relative size), i.e., we discover the lower limit of size for a sample which represents the element of income, etc. Suppose the income range is as follows—

Under $25.00 per week, ...17,000 families
$25 to $29.99 per week, ... 5,000 families
$30 to $34.99 per week, ... 2,000 families
$35 and over per week, ... 1,000 families

then our sub-sample should contain no less than 25 families in case we wish to have the highest class represented in proportion (of one in 25). If we desire two families in this class $35.00 and over, then to be rigidly logical our sub-sample ought to contain 50 families; and since this sub-sample is to be 25 per cent. of the whole sample, the whole sample on the same proportional basis should include a group of at least 200 families. The procedure would be similar for other sub-samples and in all other nationality elements, i.e., for Irish, Polish, Russian, etc.

To vary our illustration, suppose that in the hypothetical case, we should start from the wage classification instead of the nationality grouping. Our procedure might then be as follows:

First, visit each typical mill, manufacturing establishment, or commercial enterprise, in the community to get the industrial occupational range; second, from each payroll classify employees by wage differences indicative of grades of skill; third, within each wage class arrange employees

by nationality; fourth, within each nationality class arrange employees by name alphabetically; fifth, check every 5th or 10th name (depending upon the size of the sample to be taken), for a visit to that family. The combined names from all lists will then constitute a random sample representative of the total wage-earning population.

B. Empirical rules for sampling when the composition of the whole population to be investigated is not known by former studies.

1. *We can not always start from the assumption that the determining elements in the composition of the whole large group which we wish to test by sample, are known.* Of course this is the case in investigations of standards of living of American working-class families, because many studies of this subject have been made and in all of them such elements as income, nationality, size of family, number of dependents, etc., were found to be important elements. In many subjects of social investigation, however, we do not know what the determining elements are. In such cases we must rely on the procedure of random sampling. We must repeatedly dip into the unknown whole and select at random as many independent sample groups as possible. Moreover, each such sample group should be as large as efficient handling permits.

2. We might go on indefinitely selecting samples in this way, but in general, we may follow this rule: stop selecting independent sample groups as soon as comparison of the sample groups taken reveals a definite tendency among the groups,

(1) for slight variations to be more numerous than large variations, and
(2) for variations in one direction to occur as frequently as variations in the other direction.

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CHAPTER VI

COMPLETE ENUMERATION OF A GOVERNMENT CENSUS—THE TECHNIQUE OF FULL CANVASS

In the two preceding chapters the field work techniques of investigating some part of a population were described. We must now consider the technique of studying the whole population. For certain purposes we found that the investigation of individuals or groups less than the whole population was sufficient. Such a partial canvass or case study is much less costly in money and time than the canvass of an entire population. Individuals and private agencies rarely have the financial resources or the power to compel answers, and so we find that the highest development of a field work technique for enumerating the entire population of great areas has been developed by the census agencies of governments.

PURPOSE AND SCOPE OF THE CENSUS

Census taking in the United States had its origin in our theory of government.[53] The Federal House of Representatives is composed of persons selected by approximately an equal number of

[53] *Constitution of the United States*, Art. I, sec. 3.

voters. In order to select representatives in this way it is necessary to know the population of different political areas. Canvass of the population to effect the basis of representation, involves the problems of laying off districts, as well as periodic census taking. An accurate knowledge of population is also necessary for the apportionment of direct taxes.

The first census of the United States taken in 1790 was a primitive affair when compared with the elaborate and extensive organization that exists today for the same purpose. In 1790 the entire field staff was composed of 17 marshals and 650 assistant marshals. This group of canvassers enumerated a population of 3,920,214 persons. Only five inquiries were made and no printed schedules were provided the enumerators. Canvass in these times was beset with many difficulties because of the primitive means of travel. Roads were poor, bridges few, and even town boundaries undefined. The marshals encountered opposition to the census in some quarters because people had heard of the disagreeable consequences described in the Old Testament which followed the enumeration of the children of Israel.[54] It is not without reason then, that the first enumeration took 18 months to complete. Compare with the 1910 census with a field staff of 320 inspectors and 70,286 enumerators, using carefully printed population schedules containing 30 inquiries, and

[54] *The Story of the Census*, Bureau of Census, 1915.

enumerating a population of 91,972,266 in one month.

Because the purpose of the census is what it is, complete enumeration of all individuals is absolutely essential. A large field force is required to get accurate and complete returns. But trained field workers are few, hence the government has had to use great numbers of untrained enumerators. By careful pre-planning and an elaborate organization of the field work, it has been possible to utilize the services of untrained enumerators and still get good results. Lack of training is partially offset by careful organization of the field work into its smallest details. Statistical experts plan the field work with great care and analyze the problem into its minute elements. Each element is then so clearly defined and isolated that untrained observers (enumerators) can get almost as good results in accuracy and completeness as trained workers. Range of judgment of the enumerator is reduced to a minimum by detailed instructions on every possible point. There is an analogy in this plan of organizing field work to the modern organization of manufacturing industry, in which a division of labor and a specialization in production is worked out by experts and then put into operation so that unskilled labor may be used in the manufacture of highly complex articles, which under earlier conditions of production could have been produced only by skilled artisans.

MASSACHUSETTS STATE CENSUS OF 1915

As an example of the field work technique of complete enumeration, let us examine the organization and methods of the Massachusetts State Census of 1915, which enumerated a population of 3,693,310.

According to the state constitution, a census is required to provide the information about population upon which representative government may be organized. It is necessary to determine the number of legal voters to provide a basis for the apportionment of representatives in the state legislature. The state constitution nowhere explicitly defines the term *legal voters* and so it is nec essary to examine the different provisions of the constitution in order to assist in this determination. In determining legal voters certain specific information about each individual in the state is obtained, which is incidentally of great value for other purposes.[55]

"For example, since a person must be a male in order to come within the category of 'legal voters,' it is first necessary to classify the population by sex,—and to do this we must ascertain the number of males and females respectively; again, a male in order to qualify for voting must be 21 years of age or over,—consequently it is necessary to ask every male person his age in order that

[55] *The Decennial Census of the Commonwealth of Massachusetts*, 1915, Part I, pp. 5–6.

those 21 years of age or over may be separated from those under that age; it is necessary, also, that he be a citizen,—consequently we must ascertain his place of birth, and if it appears that he is foreign born, it becomes further necessary to ascertain whether he has acquired citizenship by becoming naturalized by his own act or that of his father; his period of residence in Massachusetts and in the city or town in which he resides must likewise be ascertained for each male, in order to determine how many have resided in the State one year and in the city or town of residence, six months; and since, in order to qualify for the franchise, he must be able to read and write the English language, we must determine who are able to do this. It is further necessary to ascertain how many male persons are paupers or under guardianship—a pauper being for the practical purposes of the census, one who from disease, intemperance, misfortune, or any other cause has become dependent wholly or partially upon public charity; and a person under guardianship being for census purposes, one whom it is necessary to keep under restraint, such as an inmate of a penal institution, an insane hospital, etc., as well as an idiot cared for in a private family.''

The personnel of the 1915 Massachusetts State Census was organized into two distinct staffs of workers; a permanent office staff of experienced employees in number about 200 at the maximum; and a temporary field staff of large size working

for about 30 days to six weeks at small compensation and numbering some 2041 individuals. On the field staff there were 1998 enumerators whose work was supervised in the field by 43 inspectors. Some 5,000,000 schedules were handled by both staffs.

PREPARATION FOR FIELD WORK

Before the field work of enumeration began extensive preparations were made; schedules had to be prepared and a great variety of forms to cover the intricate details of the work drawn up; the area of the state was divided into enumeration districts; a publicity plan to acquaint the people with the purposes and methods of the census was undertaken to secure intelligent coöperation at the time of canvass; and measures were taken for the careful selection of the field force. Let us consider these preparations in order.

Card schedules were used in preference to the large size paper schedule of the Federal census. The former are somewhat easier to write upon, and simpler to edit, classify and tabulate from, than the paper schedule measuring 16 x 23 inches with space for 100 different individuals, 50 on each side of the schedule. For the enumeration of population, card schedules 3⅞ x 6⅞ inches made in four colors were prepared. Blue cards were used for males, pink for females, yellow for the family card, and white for enumerating civil war veterans. Since in 1915, women did not en-

joy the franchise in Massachusetts, it was only on the male card that the full number of inquiries including specific questions about qualifications for voting were printed. The nature of the thirty-five inquiries asked may be seen from the schedules shown in figures 5 and 6. The population schedule used in the United States census of 1920 provides for twenty-nine entries besides inquiries 1, 7, 8, and 11 in common with the state schedule. Inquiries number 9 and 10 are not asked, but information on tenure of home such as whether rented, or if owned, whether free or mortgaged, are asked. The special requirements for voting in Massachusetts according to the provisions of the state constitution determine the form and number of inquiries about citizenship and cause these to differ from those used in the Federal schedule. Moreover, in the latter schedule, the inquiry about nativity is supplemented by an inquiry to determine in each case the mother tongue of the person, his mother and his father.

An important part of the work preliminary to enumeration is the preparation of the "Enumerator's Instruction Book." This consists of a book of convenient size in which are provided full instructions covering the duties and rights of the enumerator, how he is to make his canvass, just what persons he is expected to enumerate, exactly those not to be enumerated (in case of a state census persons whose regular home is in another state but who are in temporary residence

1915———CENSUS OF MASSACHUSETTS———1915

POPULATION SCHEDULE

Approved by the Governor and Council, July 15, 1914
(Chap. 692, Acts of 1914)

1-ENUMERATION DISTRICT NO.	MALE	2-HOUSE NO. (Order of Visitation)	3-FAMILY NO. (Order of Visitation)
949	[C-15-38]	40	39

4-SURNAME	5-CHRISTIAN NAME and INITIAL
Smith	William H.

6-RESIDENCE (Street and No.)	7-TOWN (or CITY)
410 Milk St.	Worcester

8-WARD	9-PRECINCT	10-BLOCK NO.	11-COUNTY
6	5	X	Wor.

12-NAME of PUBLIC or PRIVATE INSTITUTION
X

13-RELATION to HEAD of FAMILY	14-COLOR or RACE	15-CONJUGAL CONDITION
Father	W.	W.

16-ABLE to READ ENGLISH or, if not, what LANGUAGE	Eng.	18-WAR VETERAN
17-ABLE to WRITE ENGLISH or, if not, what LANGUAGE	Eng.	Civil

		23-BLIND (Both Eyes)	24-PAUPER	25-IDIOT
19-RATABLE POLL	Yes	Yes	X	X
20-LEGAL VOTER	Yes			
21-NATURALIZED VOTER	Yes			
22-ALIEN	X			

26-AGE (at last birthday)	82
27-NUMBER of MONTHS resident during CENSUS YEAR in town (or city) in which NOW LIVING	12/12
28-NUMBER of YEARS RESIDENT in MASSACHUSETTS	20
29-NUMBER of YEARS RESIDENT in the UNITED STATES	55

30-PLACE of BIRTH of this PERSON	India
31-PLACE of BIRTH of HIS FATHER	England
32-PLACE of BIRTH of HIS MOTHER	Wales
33-TOWN (or CITY) IN WHICH EMPLOYED	X

34-TRADE or PROFESSION of, or PARTICULAR KIND of WORK done by this person, as SPINNER, SALESMAN, LABORER, ETC.	35-NATURE of INDUSTRY, BUSINESS, or ESTABLISHMENT in which this person works, as COTTON MILL, DRY GOODS STORE, FARM, ETC.
Own income	X

Figure 5. Population Schedule (male) Massachusetts State census 1915.

1915————CENSUS OF MASSACHUSETTS————1915

POPULATION SCHEDULE

Approved by the Governor and Council, July 15, 1914
(Chap. 692, Acts of 1914)

1-ENUMERATION DISTRICT NO.	FAMILY	2-HOUSE NO. (Order of Visitation)	3-FAMILY NO. (Order of Visitation)
949	[C-15-37]	*40*	*39*

4-SURNAME (Head of Family)	5-CHRISTIAN NAME and INITIAL
Smith	*James B.*

6-RESIDENCE (Street and No.)	7-TOWN (or CITY)
410 Milk St.	*Worcester*

8-NAME of VILLAGE or SECTION	9-COUNTY
X	*Wor.*

10-WARD	11-PRECINCT	12-BLOCK NUMBER
6	*5*	*X*

13-KIND of HOUSE or HABITATION

Single detached brick

14-NAME of PUBLIC or PRIVATE INSTITUTION

X

15-Number of SUITES, FLATS, TENEMENTS, or APARTMENTS in this HOUSE or HABITATION	*X*	18-Number of MALES whose PLACE of ABODE on APRIL 1, 1915, was in this FAMILY	*4*
16-Number of SUITES, FLATS, TENEMENTS, or APARTMENTS UNOCCUPIED	*X*	19-Number of FEMALES whose PLACE of ABODE on APRIL 1, 1915, was in this FAMILY	*5*
17-Number of ROOMS OCCUPIED by this FAMILY	*13*	20-Number of FAMILIES enumerated in this HOUSE or HABITATION	*1*

Fig. 6. Population Schedule—Family Card—Massachusetts State Census.

as visitors, students at schools, etc., are not enumerated), and giving special instructions for making out the census schedules including a paragraph in explanation of each one of the thirty-five inquiries. The 1915 book of instructions contained 38 pages of explanation and directions carefully indexed, constituting a useful treatment of the field work technique of complete enumeration. The book, "Instructions to Enumerators" used in the United States Census of 1920 comprises 58 pages of explanations and directions grouped under 280 paragraphs and including extracts from the last census act. It supplies a description of the field work technique of the Federal census.

Enumerators in the state census were supplied with an "Enumerator's Street Book" to supplement the returns made on the card schedules in order that a further check on accuracy and completeness of canvass might be had. This book was prepared prior to the beginning of the enumeration and each field worker was provided with a copy. In this book the enumerator was required to account for every building not reported on the yellow family card as a dwelling; such for example as, closed dwellings, unoccupied dwellings, public buildings or business buildings not dwellings, and vacant lots. The "street book" was first used in the Census of 1905 for the canvass of population in the larger cities of the State. The device was so successful as a means of securing

accuracy and completeness in returns that its use was continued in 1915, and it was applied to semi-urban as well as urban populations.

In order to keep check on the work of enumerators in the field, and for the purpose of keeping the various records required by the clerical and mechanical processes of the office as well as for tabulating purposes, some 164 additional printed forms were used. Among these forms were the enumerator's commission, a description of each enumerator's district with a map, postal forms for daily work reports, sub-vouchers for use by enumerators in securing receipts from persons to whom money was paid for expenses on account of Census purposes, and interpreters' appointment blanks.

The basic geographical unit of census work from field work to tabulation was the enumeration district. The area of the State was divided into enumeration districts of approximately equal population. Determination of these districts was made with great care. In order to avoid misunderstanding, the boundaries of every district were indicated by lines drawn on maps, as well as by written descriptions. The census office made use of ordinary maps and street maps obtained from commercial map makers, maps from directories, and photographs, and blue prints of the United States Government's typographical survey maps of the Harbor and Land Commission. In all, 353 such maps of cities and towns were obtained. It

was of utmost importance to secure correct maps in order that errors due to enumerators crossing over from their own district into another and duplicating the canvass of population there might be avoided. Throughout the state there were some 2099 enumeration districts. This number included 104 so-called "Institution Districts," or the population living on the premises of certain public and private institutions. It also included 62 so-called "x" districts, which were the result of necessary sub-divisions of districts originally laid out and found difficult to canvass for some reason. The city of Boston was canvassed by the "block system," using the assessor's block as a unit and running up to a total of 4582 such blocks.

In order that the public might be in a receptive frame of mind for census taking, an endeavor was made to prepare the way for enumerators by means of a publicity campaign. To the women's clubs throughout the state some 45,000 copies of a leaflet, embodying the questions to appear on the population schedules, were sent; and to persons in a position to distribute them effectively 10,000 copies of a pamphlet, entitled "Why the Census Is Taken" were sent. Copies of a proclamation by the Governor of the Commonwealth and translated into seven languages were distributed to churches, libraries, schools, and other organizations, where the same could be given publicity.

The field force was selected from a list of those who passed satisfactorily Civil Service examina-

tions. The questions given on the examination were accompanied by facsimiles of the different population schedules and a narrative history to elicit from the candidate information as to his practical qualifications for securing the required data and entering it upon the schedule. Appointments of enumerators were made on the basis of ratings of the applicants, who had passed this examination except in certain cases where age, sex, or knowledge of some foreign language was a special qualification. Candidates for the position of inspector and special agent were also subjected to this examination and appointments were made from those who passed the examination.

Since the narrative history used for the examination was written with the view of including within its scope most of the complications and difficulties which the enumerator would meet in his canvass, perhaps no clearer idea of the difficulties faced by the enumerator and the complications which he had to solve could be given to the reader than to reproduce herewith the narrative. It will be observed the male schedule and the family schedule shown in figures 5 and 6, respectively, are filled in on the basis of this narrative.

NARRATIVE

You are to suppose yourself to have been duly commissioned an enumerator for Enumeration District No. 949 which, for the purposes of this Narrative may be said to be a part of Precinct 5,

Ward 6, of the city of Worcester, and to have called at 39 houses, one of which was an unoccupied three-family apartment house, and to have enumerated 38 families. This is the tenth day of April and you are about to enumerate the family of James B. Smith, living at 410 Milk Street, a single detached brick house of 13 rooms.

James B. Smith was born in England, May 25, 1855, his father having been born in Calcutta, India, and his mother in Edinburgh, Scotland; he came to this country in 1859 with his parents, who settled first in New York State, but removed in 1875 to Boston; in 1890 he came to Worcester, in which city he has lived since. He was married in 1877. He is a bookkeeper by profession, being in the employ of an establishment in Worcester, manufacturing copper wire.

Hannah Smith, wife of James, was born in Germany, Jan. 2, 1860. Her father was a native of Bohemia and her mother of Denmark. She emigrated to the United States with her parents in 1865; in 1870 they settled in Springfield, Mass., where Hannah graduated from the high school and lived until her marriage to Mr. Smith, when she removed to Worcester. She has no occupation but that of housewife.

Jane Smith, daughter, was born in Worcester, Mass., June 14, 1890; is a graduate of the Worcester High School, unmarried and has always lived at home with her parents. She is employed as a

teacher in the public schools of the neighboring town of Southbridge.

John Smith, son, was born in Worcester, Sept. 10, 1891; graduated from the Worcester Polytechnic School, made an unhappy marriage and obtained a final decree of divorce on April 5, 1915; has always lived in Massachusetts, being located in Fitchburg from Sept. 1, 1912, to Nov. 1, 1914, and since then has lived with his parents; is now employed as an electrical engineer in one of the Worcester city departments.

Mary Smith, daughter, was born in Worcester, Dec. 30, 1893, and has always lived in that city; graduated from the high school in 1911; was married in 1913 to Daniel Murphy, a native of Nova Scotia, who met with a fatal accident in January, 1915, when his wife returned to her father's house to live.

Martha Smith, sister, was born April 30, 1859, on shipboard during the passage of the family from England; had a grammar school education; has never married and has always lived with her brother and his family; in later years has suffered from a mental trouble and on the advice of the family physician went recently to a sanitarium in Brookline for treatment, anticipating being able to return home in a few months.

William H. Smith, father, was born in Calcutta, India, Feb. 10, 1833, his father being a native of Liverpool, and his mother of Cardiff, Wales; he

emigrated to the United States in 1859. In 1865 he took out his final naturalization papers, but in the meantime enlisted for service in the Civil War in Co. B, Sixteenth Regiment of Infantry, New York Volunteers. He has not been able to work for several years, having become totally blind as the result of a wound received in battle, but enjoys a modest independent income, which enables him to pay for his board and lodging and other ordinary living expenses. He came to Massachusetts in 1895, and since the death of his wife has lived with his son in Worcester.

Alexander Petrovsky, lodger, a dealer in fruit, lives with the Smith family. He was born in Warsaw, Russian Poland, Aug. 22, 1889, his father being also a native of Warsaw and his mother of Moscow, Russia. At the age of twenty-two he came to this country and has lived in Massachusetts since 1911, and in Worcester since September, 1914. He can read but cannot write English; but he can both read and write Yiddish, for he is a Polish Jew. He is unmarried.

Ellen O'Neil, domestic servant, was born in Nova Scotia, June 14, 1891. She can read but cannot write English and knows no other language. Her father was born in Ireland and her mother in Scotland. She came to Boston from Nova Scotia in 1904, remaining there until 1905, when she came to Worcester and has since lived in that city.

SUPERVISION OF FIELD WORK

The author, as inspector of District Number 39, had under his supervision 30 enumerators, engaged to canvass a population of about 70,000 inhabitants, distributed over an area which included one city and four different towns. Among these 30 enumerators the following vocations were represented: teacher, carpenter, college student, grocer, mail carrier, high school student, in addition to men and women temporarily without employment. Enumerators received pay on a piece-work basis, accordingly as their district was urban or rural, and correspondingly accessible and easily traversed. They received from 2½¢ to 11¢ per person enumerated. In addition, 1¢ each was paid for every family schedule and every civil war veteran schedule turned in. Inspectors were paid at the rate of from $4 to $5 a day and expenses. Interpreters received not more than 30¢ an hour. The total cost of the field work of the 1915 Massachusetts Census, including travel expenses, was $107,000 as against a total cost of $160,000 for a smaller population enumerated in 1905, but when the pay was at the rate of $3 per diem for enumeration instead of by piece-work.

Once in the field, enumerators were cautioned to be courteous and conciliatory in their manner of approach under all circumstances. The information which an individual gives to the enumerator is regarded as strictly confidential. The

method of canvass is to proceed from left to right, following the contour of each block, and being careful to ascertain that every building within the block is visited in order that no dwelling house may be omitted. The usual place of abode of a person is for census purposes the place where he sleeps. The population is enumerated as of April 1st. This excludes individuals born on April 2nd and afterwards, but includes any who died after April 1st. Individuals, who as visitors are temporarily included as members of a given family, are not enumerated where temporarily found but are returned for their usual place of abode. Any building or place of abode in which any person is living at the time the census is taken is regarded as a dwelling house—it may be a room in a factory, a loft over a stable, a boat, a tent, or a freight car.

When the family is not at home on the first visit, the enumerator is required to make an entry to this effect in his "street book" and to return the next day for the purpose of obtaining the information and properly filling the schedules. In some cases one individual of the family is away when the call is made. In such instances a special form of inquiry is left which the absentee is asked to fill in himself upon his return and leave in an official sealed envelope for the enumerator to collect on a later call. The enumerator is expected to enter such back calls in his "street book."

At the close of each day's work the enumerator fills out a daily report card, which is mailed to the census office. Hereon is given a memorandum of the number of schedules filled that day. Besides this daily report to the office the enumerator keeps for his own record a copy of this memorandum entered upon a day's work ticket which is placed on top of the pile of schedules completed that day. When the canvass of a district is concluded, the enumerator forwards all of his schedules in packages to the central office by prepaid express.

This work of enumeration is supervised in the field by the inspectors. In 1915 there were from 21 to 58 enumerators under the supervision of an inspector. The inspector holds frequent conferences with the enumerators in order to answer their questions and assist them in overcoming difficulties. At these times he examines their work by random inspection of schedules. In this way faulty work is discovered and enumerators held up to standard. An inspector may often work over several streets behind an enumerator and upon meeting him check up the latter's returns against the provisional entries that he, himself, made for the purpose of checking. When interpreters are needed, it is the inspector's duty to inquire into the circumstances and secure the services of the interpreter.

Rural districts not under the personal supervision of inspectors were supervised direct from the census office by daily correspondence and by

occasional visits of special agents. For this purpose, and also to answer the letters of other enumerators, an office staff of 7 correspondence clerks was maintained. Each clerk attended to 300 enumerators. Answers to questions raised by enumerators in the field were mailed out. Wherever possible frequently occurring inquiries were segregated so that all enumerators might have the benefit of an answer and a form letter was sent out. Generally an answer to the question or a solution of the difficulty could be found by simply referring the enumerator to the proper page and paragraph of the instruction book.

Although returns from the smaller and more accessible districts came in promptly, even after a few days in certain instances, it was usually three months before all returns were in. Delays in enumeration were due to a variety of circumstances. In some cases enumerators were unable to begin promptly or could give but part time, in other cases sickness, negligence and unforeseen events hampered the canvass. With such a large body of field workers the causes of delay are numerous and varied. In extreme cases clear malicious neglect of duty was discovered. But even in these instances dismissal is not always the best remedy for even when a competent person can be found to act as a substitute, there is always the question of arranging the details of taking up the work where the discharged enumerator left it with the likelihood of duplicating or omitting popula-

tion, so that entire re-canvass may have to be made as the only feasible plan. In general, the census officials are obliged to be as tolerant and patient as possible in the face of all these vexations since the peculiar character of the undertaking makes the work of temporary character. In this respect census work of a government agency shows a likeness to many private enterprises where extreme tact and considerable moral suasion are necessary to secure good results when the large numbers of non-professional or volunteer workers are engaged.

The problems of editing schedules, compiling statistics from them, of classifying and tabulating these returns, will be considered in a later chapter.

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PART III

SPECIAL PROBLEMS CONNECTED WITH FIELD WORK

CHAPTER VII

PURPOSE AND PREPARATION OF SCHEDULES FOR FIELD WORK

Indispensable to field work, whether it be sampling or complete enumeration, is the schedule. The schedule is a mechanical device designed to objectify the recording of observations of complicated social phenomena, and to standardize the returns made by different observers.

There is an analogy between the schedules of social science and the instruments used in observation and measurement in the older sciences. The telescope, the spectroscope and the camera used in astronomy extend the observational power of the senses. The magnifying power of the telescope discloses details which the naked eye can not discern. This is due to its light-gathering power which uncovers stars too faint for the human eye to observe unaided. The spectroscope, originally used for the determination of the quality of light, is now used to measure the speed of light and so extends the observational power of the senses. By using a camera with long exposure, objects are brought out on developing the photographic plate which can not be seen by the eye even through the

telescope. By these mechanical instruments observation of certain classes of natural phenomena (planets) are more extensive and more intensive. The range of observation as well as the detail observed is increased.

THE SCHEDULE A MECHANICAL AID TO OBSERVATION

By using a schedule the student of social phenomena can extend his powers of observation enormously over the observer not so equipped. The person who goes on a tour of inspection of the congested quarters of a city depending upon his powers of memory to report faithfully and objectively his impressions of the dirty streets, the crowded tenements, the shabby moving throngs and the excited and anaemic children, will not be likely to return with impressions that can be stated in precise language. On the other hand the housing investigator supplied with standard housing schedules observes the social facts in a methodical manner, and secures answers to inquiries that are arranged in a systematic fashion, so that he returns with records of observations that range over a large field of facts including repair, sanitation, lighting, ventilation, fire-proofing and protection, and overcrowding, as well as extent into a detailed analysis of each group of facts and conditions. In this way the observation of social conditions is made more extensive as well as intensive and results are had that can be stated in language of some precision.

STREET NO. BLK.

BUILDING

Front-Rear-Brick-Frame Stories-Cel.-Base.-Attic Ap'ts. per floor

STORES

None No. Kind Cleanliness Food exposed

BASEMENT

(B.F.....) Distance from floor to ceiling Light Damp Occupied

HALLS AND STAIRS	FLOOR		WALLS		CEILINGS		STAIRS		
	Cl'n	Rep.	Need P. or W.	Rep.	Need P. or W.	Rep.	Cl'n	Rep.	Degree
Cellar Base.									
1									
2									
3									
4									
5									

OWNER'S NAME

AGENT'S NAME

REMARKS

Symbols are V.-Yes. O.-No. G.-Good. F.-Fair. B.-Bad. Dk.-Dark.

Figure 7. Housing Schedule—

WD. DATE INSPECTOR

C. B. 1. 2. 3. 4. 5. 6. A. Total 1907— 1907+ Roof leaking

Living at rear
CELLAR

(B.F.....) Dist. fl. to ceiling Light Damp Occupied Cleanliness

LIGHT				BULKHEAD
Windows to air	Windows to room	Sky-light	At night	Locked Obst. Windows Moveable AIR SHAFTS
				No. Size Covered Cleanliness COURTS
				No. Size Paved Repair Drainage YARD
				Depth Paved Repair Cleanliness FIRE ESCAPES
				Kind Adequate to ASH AND GARBAGE RECEPT.
				No. Metal Wood
				Covered Where kept Emptied how often STREET OR ALLEY Nuisance

Paved Repair Cleanliness

ADDRESS

ADDRESS

NOTES

D.-Dirty.

House Card (front of form).

APARTMENT	Kitchen	Living room	No. bedrooms	Total	NO. ROOMS IN VIOLATION OF SECTION 70				FIXTURES IN APARTMENT			
					With windows			Without Windows	W. C.*	Sink ‡	Wash tub	Bath
					To air	To rm.	To sft.					

WATER CLOSET	*	Location [off.]	Type	Enclosed	Fl. w-p.	Flush ad.	Repair	Wd.-wk. in rep.	Clean	Fl. clean	VENTILATION	
											Kind	Shared with

‡ SINK

Loc. if not in apt. Iron Enameled Enclosed W-s. ad.

Figure 7. Housing Schedule—

Water supply	Cleanliness	Light	Ventilation	Repair	RENT		OCCUPANTS						
					Week	Month	Nat.	Fa.	Mo.	Ch. −14	Ch. 14+	No. Ldgr's	Total

VENTILATION														
To air	To rm.	To sft.	To hall	Gas	Gas lighted	Flame beneath op'n'g	Odor	Artificial light	Degree natural light	Glass in door	Op'n'g in, or door not to T. or B.	Partition not to ceiling	Privacy	

Repair Wd.-wk. in repa Clean Rusted Odor

Form I

House Card (back of form).

Not only do the mechanical instruments of observation and measurement used in science make for an extension of the observational powers of the senses, they also facilitate measurement by placing comparison on a quantitative instead of on a qualitative basis. Thus differences between phenomena are susceptible of measurement in objective terms. Color differences are found to be measureable in terms of the number of light vibrations and in this way qualitative differences are expressed quantitatively. In so far as quantitative modes of expressing qualitative differences are possible, observation becomes objective and the personal bias or partiality of the student is minimized so that the records of his observation become as true for any other human mind as for his own thus taking on the element of universality which characterizes all true science.

It used to be frequent in making entries on a schedule to qualify the description of a certain fact by qualitative terms. Thus the condition of repair was said to be good, fair, or bad. The present emphasis in social studies is all against the use of qualitative terms in recording the observer's impressions of a social fact. Miss Ralph [56] makes it a rule for record keeping that the use of terms which express judgments such as "good," "bad," "doing well," etc., and of such indefinite terms as "incorrigible," "immoral," "laborer," etc., should be avoided. In the inves-

[56] Ralph, G. S., *op. cit.*, p. 116.

tigation of factory conditions, for example, instead of reporting that the air, lighting, or noise is "good," "fair" or "bad," the student's report on the condition of the air is given in terms of temperature and humidity, of ventilation and room space, of dust and fumes, of the presence of an exhaust system, or of smells. In this way objective rather than subjective terms are used, and the schedule which assists the investigator to record his observations in these terms becomes a device which permits precise expression. In fact, the measurement by the schedule of qualitative social differences in quantitative terms is so important that we shall consider this matter again in greater detail.

One other service the mechanical instrument of observation performs for science. This is the isolation of one element at a time. It is hardly necessary to elaborate upon the way in which the telescope and the camera isolate one factor at a time by concentrated attention upon it. In the case of the schedule much the same service is performed for social science. In housing investigations the schedules differ from those used in budget and wage studies, but in the housing investigation the attention of the student is still further concentrated upon one element in the situation at a time. By using a "lot card" in which the physical conditions of the building such as environ ment, structure, repair, and sanitary conditions are treated in some detail the observer is assisted

in isolating these basic facts from the general mass of impressions, relating to the more distinctly social aspects such as the number, ages, and relationships of occupants, interior cleanliness, light, ventilation, and general sanitary provisions. These latter are usually entered on a separate "house card."

To sum up the principles of scientific observation which the schedule makes possible:

(1) The schedule objectifies the observation of complicated social phenomena.

(2) The schedule standardizes the recording of unbiased observations made by different students.

(3) The schedule is a scientific instrument of observation and measurement because:

(a) It extends the observational power of the senses by making observation both more extensive and more intensive.

(b) It makes possible measurement in quantitative rather than qualitative terms.

(c) It isolates one element at a time so that the observer may concentrate his attention upon it.

THE FORM OF THE SCHEDULE

The *form* of the schedule is important as it furnishes mechanical aids to the eye in systematically recording observations of social phenomena. Considerable variety is found in the form taken by schedules used in different types of social and industrial investigation.

(1) Size. The schedule should be of convenient size to slip into the pocket of the field worker without folding or crushing. Many schedules are now made 5 x 8 inches. This size is not only convenient for handling in the field but it is also a standard size for filing purposes. If a larger schedule is necessary, it is recommended that the regulation correspondence size 8½ x 11 inches be used. Filing devices are ordinarily constructed to file this size of card conveniently.

(2) Material. A cardboard heavy enough to write easily upon when held in the hand is the best material out of which to make the schedule. The surface should be smooth and hard enough to write upon with pen and ink.

(3) Color. In an investigation where several different inquiries need to be made, such for example as into the standard of living, several schedules are used and it is convenient to have the different schedules of different colors, white, yellow, blue, pink, etc. This color device simplifies the task of editing, classifying and filing, and aids the eye to avoid the confusion that results when handling schedules used for different purposes but of similar appearance.

(4) Ruling. It is always desirable to separate the upper portion or heading of the schedule from the body. This can be conveniently done by a heavy line ruled horizontally across the top and far enough from the upper edge to leave sufficient space for the full identification data which should

DETROIT HOUSING COMMISSION

MULTIPLE HOUSE CARD

STREET..... No..... WARD.....

ENVIRON'T

LOT
Size X
Corner
Through
% Cov'd

STREET
Material
Earth Wood
Macadam
Asphalt
Brick Stone
Repair G F B
Clean C D F
Sewer

SIDEWALK
Material
Earth Wood
Brick Stone
Cem't Conc't
Repair G F B
Clean C D F

ALLEY
Paved
Material

Condition

Clean C D F

HOUSE FACES
Street Alley
Back Yard

ANIMALS on PREMISES
Kind
No.
Where

Nuisance

YARD

Size X

Material
Earth Brick
Cobble Flag
Concrete
Rough Brkn.

Drainage
Sewer Surf.
Adequate

Dampness
Dry Damp
Wet Water

Rub'sh FSM
Clean C D F

CESSPOOL
Location
Condition

HYD'T Loc'n | WELL

Condn.

S'ply | Pump
A D N | Cov'd

DRAIN
Clean C D F
Free Obstr'd

RECEPTACLES
Garbage | Ash
Mat'l
Adeq.
Suitable
Nuisance

WATER CLOSETS
None No.
No. Comp'ts
No. Seats
No. Fms. Use
In Bldg.
Outside
Clean C D F
Repair G F B
Sat'd W'd'k
Type–LH SH
Pan Wo OW
SJ TW Wd
Flush
Tank Valve
Adeq.
Inclosed
Trapped
Frost Proof

PRIVIES
None No.

C D F
G F B
Vault
Earth Wood
Brick Crock
Tight
Leech'g
Full Overfl'g
Sewer
Con'ctd
Flush
Dry Earth
Disfd. Nuis.

BUILDING

Size X

Material
Frame Cem't
Veneer Br'k
Stone
Stories–No.
At. Bas. Cel.

Repair G F B

Nearest Bldgs.
Dist. | Mat'l
N
S
E
W

Apts. per Flr.
C B
1 4
2 5
3 6

Total Apts.
Blt. for Ten't

STORES
No. Loc'n

Kind

Nuis. Saloon
Fire Peril

OTHER BLDGS.
Character
Material
Size
Purpose
Condition

CELLAR-

ACCESS FROM
St. Yd. Intr.
Use
Business
Storg. Dwlg.

Floor
Earth Wood
Brick Cem't

Walls Ceiling
w w o r p w w o r p
C D F C D F

Dampness
Dry Damp
Wet Water

Ventilation
Windows
Area grat'gs
Adeq. None

Light L G D
Clean C D F
Repair G F B
Rub'sh FSM

LIVING RMS.
No. Height
Above grade
Area
Entire width
Drained

PLUMBING LINES
Waste | Soil
Exposed
Mat'l
Diam.
Op'ngs

Figure 8. Multiple

(MULTIPLE, TENEMENT AND DOUBLE HOUSES)

DATE..... INVESTIGATOR.....

BASEMENT

HOUSE DRN.
Expd. Diam.
Iron Earthw.
Brick
Free Obstr'd
Patchd. Snd.
Opengs. noted

HOUSE TRAP
Location
Acces'l Cvd.

FRESH AIR INLET
Ends where
Free Choked

WATER CLOSETS
None No.
Type
Flush Adeq.
Inc. Tp. Vnt.
Clean C D F
Repair G F B

W.C. CMPTS.
None No.
Clean C D F
Repair G F B
Light L G D
Ventilation
Outer air
Vent. shaft
Open cellar

SINKS
No. Mat'l
Inc. Tp. Vnt.
Clean C F D
Repair G F B

HALLS AND STAIRS

Enter from street	Flr.	Light	Vnt.	Clean	Rpr.
	CB				
Front door locked	1				
	2				
Skylt. None Vntg.	3				
	4				
	5				

WATER CLOSETS
None .No..
Loc'n
Type
Flush
Adeq.
Inclosed
Trapped
Ventil'd
Cl'n C D F
Rep. G F B
W. CLOS.
COMP'TS
Lgt. L G D
Ventlated
Cl'n C D F
Rep. G F B
FIRE ESC.
Where
Cond'n

SINKS
No.
Loc'n
Mat'l
Inclosed
Trapped
Vented
Cl'n C D F
Rep. G F B

HYDR'TS

URINALS—No.
Where Cond'n

ROOF
Access
Scuttle
Bulkh'd
Ladder
Stairs
Locked
Obstr'd
Repair
Tight
Leaking
Rubbish F S M

PIPES ABV.
Soil Waste
Vent
Rain Ldr.
Material
Rep. G F B
Used as waste pp.
Discharges how

MISCELLANEOUS

ASSESSED VALUATION
$ .....

RENT
All Apts. $.....
Stores .....
Stable .....
Garage .....
.....
.....

No. Vacant Apts.
No. Vacant Rooms

Janitor on Premises

WATER SUPPLY
Hydrants No.
Yard Halls Apts.
Condition
Wells No.
Cov'd Pump
Where
Condition

Abbreviations: G. F.B., Good, Fair, Bad; C.D.F., Clean, Dirty, Filthy; F.S. M., Free, Some, Much; A.D.N., Adequate, Deficient, None; L.G.D., Light, Gloomy, Dark; WW. or P., Whitewash or Paint; L.H., S.H., Wo., OW., SJ., TW., Wd., Long hopper, Short hopper, Washout, Offset Washout, Siphon Jet, Tidal Wave, Washdown; V, Yes; O, No.

* See over.

House Card.

General Condition and Aspect

Moral Surroundings and Influences

Special Dangers or Conditions

General Remarks or Recommendations

*

Owner Agent

Address

Photograph Recommended to Show

DIAGRAM OF PREMISES
Front—N. E. S. W.

Scale.....Ft. to the Square.
Indicate fences, walls, buildings, etc., on lot boundaries.

Figure 8. Multiple House Card.

appear therein. Below, in the body of the schedule, it is of assistance to the eye of the field worker in recording his observations and to the editor in checking the returns to have light ruled horizontal lines separating the main categories of the analysis.

(5) Spacing. Do not crowd the chief categories used as main headings in the body or analysis of the schedule. Have these titles sufficiently separated so that they stand out conspicuously, otherwise they defeat the purpose of being an aid to the eye.

(6) Typing. In accordance with the importance of a category or title use bold or small face type. The heavier letters aid the eye in locating the particular spot in the schedule at which a certain entry is to be made. Compare figures 1 and 2. It must be remembered that the ordinary 5 x 8 inch schedule contains a large number of inquiries and mechanical aids to the eye such as these enumerated which are of great assistance to the field worker and the editor.

A combination of the aforementioned mechanical aids to the eye is often advantageous and is accomplished by using a *chart form.* According to this method the titles or main categories in the inquiry are boxed in by vertical and horizontal lines much as the captions in a statistical table are presented. It is sometimes advantageous also to combine these box headings with captions arranged in the stub in vertical column. A "house

card'' which follows this plan is given in figure 7. In the center of the schedule appear boxed headings in a row from left to right, ''floor,'' ''walls,'' ''ceilings,'' ''stairs,'' and ''light.'' Under each of these main categories are two or more subcaptions arranged in a row on the line below. At the left in a column reading down vertically are given a series of stub captions. In this way it is possible for the field worker to classify his observations systematically as he records them. Another example of chart form is shown in the ''multiple house card,'' figure 8. The third example is the infant mortality schedule used by the Children's Bureau and shown in figure 4. The chart form of the schedule may be improved by the use of light or heavy or colored rulings. It is often convenient to rule horizontally at equal intervals and provide marginal numbers running serially from top to bottom.

Inquiries are sometimes advantageously presented in an *outline form* with main headings and sub-headings rather than in a chart form. A simple example of this method of schedule structure is given in the ''lot card,'' figures 1 and 2. The infant mortality schedule of the Children's Bureau is a much more elaborate example of the outline form. In this connection the student should compare ''lot card'' figure 1 with ''lot card'' figure 2 and note how the bold faced type of the main inquiries on ''lot card'' figure 1 as compared with ''lot card'' figure 2, improve the clar-

ity of the schedule and assist the field worker in recording his observations and the editor in transcribing and tabulating.

In the fields of social investigation, where the raw material has been well worked over by numerous field studies, most of the essential factors have been recognized, and schedules itemizing the elements in great detail, such as given in figures 1 to 8 inclusive have been devised; but in fields of study where many of the elements are as yet unknown, such detailed analysis is not possible. In all such cases a *questionnaire form,* which states the inquiry as a definite challenge to the resourcefulness and ingenuity of the field worker, will be found useful. The home economics committee of the New York Charity Organization Society has made use of suggestive questions such as the following concerning budget readjustments in the families of their clients.

"Is the family in the same rooms as last year? If so is the rent the same? If not, was the change made in order to reduce rent? to accommodate lodgers?

What fuel economies are being practiced? Are fewer rooms being heated? Is the fire kept for a smaller number of hours? Is kerosene being substituted for coal or gas for heating or lighting?

Is less milk being purchased? less meat? fewer vegetables? Are less expensive foods being used in larger quantities than previously (butter substitutes, dried beans, etc.)

Are pushcarts, special bargain stores, coöperative stores and other economical buying places being patron-

ized more frequently? Is more time being used in seeking for especially low prices?

Have you had difficulty in affording as much clothing as formerly? Were you fortunate enough to have clothing left over from last year? What special clothing economies have you practiced?

Has there been more sickness (especially of children) than usual?

Has paid amusement been lessened? Are fewer newspapers and magazines being purchased?

Has it proven possible to keep up insurance? to take out new insurance? to save money in other ways?''

Questions illustrating the same principles form part of a questionnaire sent by the Children's Bureau [57] to judges of juvenile courts or courts hearing juvenile cases, see figure 9.

ARRANGEMENT OF INQUIRIES

Turning now from a consideration of the principles involved in selecting the form of the schedule let us consider the arrangement of the inquiries printed upon it. It goes without saying that the elementary principles of uniformity and standardization require that schedules be printed in bulk in identical form and arrangement. The arrangement of inquiries on a schedule falls into two divisions: first, the heading or identification inquiries arranged across the top; and second, the

[57] *Courts in the United States Hearing Children's Cases*, by Evelina Belden, U. S. Dep't. of Labor, Children's Bureau, Bur. Pub. No. 65, pp. 103–104.

SCHEDULE FOR FIELD WORK

UNITED STATES DEPARTMENT OF LABOR, CHILDREN'S BUREAU, WASHINGTON.

JUVENILE COURTS OR COURTS HEARING JUVENILE CASES

Questionnaire to be answered by judge.

(We will welcome details about your court. If more space is desired please use an additional sheet.)

Official name of court.....

City, town, or village..... District.....

County..... State.....

I. JURISDICTION

1. Is there a special judge giving his whole time to children's cases?.....
2. Is there a woman referee to assist the judge in girls' cases?.....
3. Indicate by a check which of the following classes of cases were heard in your juvenile sessions during your last fiscal year:
   - (*a*) Delinquent children.
   - (*b*) Neglected children.
   - (*c*) Destitute or dependent.
   - (*d*) Truant children.
   - (*e*) Questions of adoption.
   - (*f*) Other children (specify).
   - (*g*) Child labor.
   - (*h*) Nonsupport or desertion.
   - (*i*) Contributing to neglect or delinquency.
   - (*j*) Divorce or alimony.
   - (*k*) Mothers' pensions.
   - (*l*) Other adult (specify).
4. Is there any effort being made in your community to combine in one court all family and child problems?.....
5. Does your court have an advisory board of citizens?..... If so, how is this board secured?..... What are its duties?.....

II. PROBATION OFFICERS.

1. How many paid probation officers are there who give full time to children's cases: (*a*) Men?..... (*b*) Women?.....
2. Are officers appointed by (*a*) civil service examination?..... (*b*) The judge?..... (*c*) Other method of examination or appointment?..... Is the examination written, oral, or both?.....
3. How long is the term of office?.....
   Are officers paid yearly salaries?..... How much?.....
   If not yearly salaries, how are they paid and how much?
4. Are there other persons officially authorized to make investigations or do probation work for the court?..... (*a*) Paid probation officers who give part time?..... (*b*) Volunteers?..... (*c*) Agents from private societies?..... (*d*) Public officials such as sheriff, truant officer, public relief agent, police, etc. (specify)?.....
5. Does the court require regular reports of the child's progress from special or volunteer officers?.....
6. Are children placed on probation to the judge?.....

Figure 9. Portion of a questionnaire on juvenile court investigation.

body or analysis which includes the bulk of the inquiries.

Headings or *identification* should be complete. That is to say, all of the information required to identify the particular house, family, individual or other unit described upon the schedule, should be provided for by proper inquiries, such as name, address, location, age, sex or other facts pertaining to the exclusive nature of the particular investigation under consideration. It is also desirable to provide a space in the heading for the date when the schedule was filled and the name of the field worker or agent. These identification inquiries should be not only complete but concise. That is to say, superfluous inquiries, which unnecessarily pad the number of subordinate items in the heading and fill up space without adding anything vital to the identification of this particular individual or unit of study, should be avoided. The chief purpose of the heading part of the inquiry is to supply the basis for identification in filing and for ready reference or cross indexing purposes.

The *body* or *analysis,* which follows directly under the heading of the schedule, contains the great bulk of inquiries. Since this portion of the schedule is for an analytical record of the main characteristics of the unit or individual investigated, the inquiries should be arranged in logical order. In general the inquiries in the body or analysis of the schedule should be (1) extensive,

that is, complete as regards the main and essential topics of investigation; (2) intensive, that is, sufficient detail of analysis under the main topics of inquiry to round them out but avoiding superfluous detail. Here again the student should examine the infant mortality schedule, which shows a combination of chart and outline form with main topics analyzed into their elements. It is well to number all inquiries upon the schedule serially, beginning with the first inquiry of the heading and concluding with the last inquiry in the body.

CONTENT AND PHRASING OF INQUIRIES: DEFINITION OF UNITS

It is important to use great care in determining the *content of inquiries*. The units and terms used in inquiries should be thoroughly understood and defined before hand in order that ambiguous meanings may be avoided. If the term "price" is used, its meaning should be understood. For example, retail or wholesale price? Price at what place? Under what conditions of sale? To whom? Price of what grade of commodity? On what market? Are the price data extant? Will they continue to be available? Are prices contract, import, or market prices? The term "working-class" upon analysis appears to be very general and quite vague, yet the term is frequently used in social-economic investigations. Bowley,[58] in studying working-class families excludes the oc-

[58] *Livelihood and Poverty.*

cupants of houses who are (1) Professional, commercial, or living on property income; (2) Clerks, travellers, teachers, shop managers, and small employers; (3) Shop assistants, except where working for butchers or grocers.

Secrist [59] has contributed to our knowledge of the precise nature of statistical units of measurement. He says:

"If our problem were simply to enumerate the number of manufacturing establishments in a given district, the definition of this unit would obviously be determined by the following conditions: (a) The meaning of manufacturing as distinct from trading, mercantile, transporting, agricultural, etc., pursuits. (b) The meaning of an establishment. The definitions employed will depend upon the purpose in mind in using them. If it is to learn the number of such enterprises when the criterion of individuality is ownership, one condition maintains; if the criteria are independent existence respecting the processes involved and the management over them, independence respecting housing conditions or contiguity, independence respecting relative location, etc., then other conditions as surely maintain. In the first case the fact of ownership determines the fact of enumeration; in the other cases, respectively, independent processes through which manufactured goods pass while under one management or ownership, the fact of being contiguous or

[59] *Introduction to Statistical Methods*, pp. 61–2.

under one roof, the fact of being located in the same political or economic jurisdiction. In these cases it is not enough to maintain that an establishment is an establishment; the identity, and therefore the number to be enumerated, depends upon the criteria which are set up. The statistical process of grouping and combining is impossible unless the units enumerated are identical in the particulars chosen as a basis for enumeration."

In discussing measures of capacity, Florence[60] shows how the output rate which is usually adopted as a measure of capacity in the investigation of industrial fatigue may be an equivocal term. He says "even when the type of worker is constant or when the output of exactly the same workers is studied throughout, certain working conditions are liable by their inconsistency to render the output an ambiguous measure of capacity." Conditions may not be ready for work to take place. For example, the worker may be waiting for his material to be brought to him or for his machine to be repaired or for the power to be connected with his machine.

As an example of an ambiguous statement of an inquiry consider the case of a questionnaire sent to selected employers throughout Massachusetts by the State Board of Labor and Industries in 1915. The inquiries were under three main top-

[60] Florence, P. S.—"The Use of Factory Statistics in the Investigation of Industrial Relations," Col. Univ., *Studies in Hist., Eco. and Pub. Law*, vol. 81, No. 3, p. 46.

ics. The question which caused difficulty asked for the "Largest number employed at any one time during the year on approximate date." The aim of this question was to obtain from each employer the largest number employed at any one time during the year. Unfortunately the two main topics following the one aforementioned related to the number employed on full or part time upon November 1st of the year. In answering the first main inquiry fully half of the employers gave the number employed on November 1st, thus simply duplicating figures given in the other columns.

Mitchell[61] graphically describes the difficulties encountered by the investigator of prices, "We commonly speak of *the* wholesale price of articles like pig iron, cotton, or beef as if there were only one unambiguous price for any one thing on a given day, however this price may vary from one day to another. In fact there are many different prices for every great staple on every day it is dealt in, and most of these differences are of the sort that tend to maintain themselves even when markets are highly organized and competition is keen. Of course varying grades command varying prices, and so as a rule do large lots and small lots; for the same grade in the same quantities, different prices are paid by the manufacturer,

[61] *Index Numbers of Wholesale Prices in the United States and Foreign Countries*, U. S. Bureau of Labor Statistics, Bul. 179, 1915, pp. 27–28.

jobber, and local buyer; in different localities the prices paid by these various dealers are not the same; even in the same locality different dealers of the same class do not all pay the same price to every one from whom they buy the same grade in the same quantity on the same day. To find what really was the price of cotton, for example, on February 1, 1915, would require an elaborate investigation, and would result in showing a multitude of different prices covering a considerable range.

"Now the field worker collecting data for an index number must select from among all these different prices for each of his commodities the one or the few series of quotations that make the most representative sample of the whole. He must find the most reliable source of information, the most representative market, the most typical brands or grades, and the class of dealers who stand in the most influential position. He must have sufficient technical knowledge to be sure that his quotations are for uniform qualities, or to make the necessary adjustments if changes in quality have occurred in the markets and require recognition in the statistical office. He must be able to recognize anything suspicious in the data offered him and to get at the facts. He must know how commodities are made and must seek comparable information concerning the prices of raw materials and their manufactured products, concerning articles that are substituted for one an-

other, used in connection with one another, or turned out as joint products of the same process. He must guard against the pitfalls of cash discounts, premiums, rebates, deferred payments, and allowances of all sorts. And he must know whether his quotations for different articles are all on the same basis, or whether concealed factors must be allowed for in comparing the prices of different articles on a given date."

It should always be remembered that nothing will come out of an investigation that has not first been put into it as a subject for inquiry and no data will be received unless definitely called for on the schedule. The inquiries should therefore be complete.

CONTENT AND PHRASING OF INQUIRIES: PHRASING OF QUESTIONS

After the investigator has selected and defined the units by which inquiries are made upon the schedule it is important to consider the phrasing of the questions. As far as possible inquiries should be corroboratory, that is to say, questions which check one another are desirable. For example, inquire not only about the age but ask for the date of birth. Solenberger, in a study of 1000 homeless men began by inquiring "Are you married?" It became clear that answers to this inquiry were frequently untruthful. The phrasing was changed to read "Where is your wife?" By this device a higher percentage of truthful

answers was obtained because the informant was caught unawares. In framing inquiries, therefore, it is often useful to adopt *slant-wise suggestions* rather than the direct question.

Inquiries should be so phrased that they may be answered without bias by the informant or by the field worker. It is not desirable to arouse the antagonism of an informant by an unnecessarily inquisitorial form of phrasing. One way of avoiding bias in records made upon a schedule is to minimize the personal equation of the field worker by asking for facts rather than opinions. Inquiries should therefore permit of an answer in objective terms, thus leaving little to the judgment of the field worker. As an example of this, wherever possible choose inquiries which may be answered by "yes" or "no" or by some number. By careful analysis of the conditions to be investigated before field work is begun it is possible to frame inquiries which may appear upon the schedule in the form of an enumeration of all possible answers. In such a case the field worker is directed to check the correct answer. This principle has been applied in the construction of "lot cards" shown in figures 1 and 2. The reader will observe how the observations are recorded by a simple check placed over the word which correctly describes the conditions. This plan of presenting inquiries saves time in addition to minimizing variations in individual judgment. Wherever possible use quantitative terms as substitute

for qualitative. We have already mentioned this principle and it is of such great importance to scientific observation in field work that we must now discuss it at considerable length.

The reader will note that on the "lot cards" the condition of repair may be indicated by checking G, F, or B, in accordance with his judgment that the conditions are "good," "fair," or "bad." Such terms are to be avoided by substituting for them, words of more precise meaning and less likely to vary between individuals in use. For example, instead of saying that the lighting of a certain room was (1) good, or (2) fair, or (3) bad, it would be better to record observations of (1) direct sunlight, or (2) indirect natural light (as through another room), or (3) artificial light. In this way there has been substituted for qualitative terms, that show considerable variation among investigators, a series of precise and objective terms upon which most observers would agree. Let us consider other examples. Instead of recording ventilation as (1) good, or (2) fair, or (3) bad; the terms (1) outside fresh air, or (2) open air shaft, or (3) closed air shaft, or (4) through another room, might be used to greater advantage.

In factory investigations the condition of the air may be described by using such objective terms as dust and fumes, exhaust system, smells, ventilation, and room space, and by such quantitative expressions as temperature and humidity. The

adequacy of lighting may be described in terms of volume, concentration, and glare. The amount of noise may be described in terms of volume, irregularity, and vibration.

In a study of the standard of living attention may need to be given to neatness of clothing worn by different members of the family. It would not be accurate to use such qualitative terms as "neat," "untidy" or "dirty" but objective terms in the use of which most observers would agree should be used. These might be "spotted," "dusty," "torn," "worn," "patched," "mussed" or "wrinkled." In reporting on the condition of the furniture instead of saying that the condition was "good," "fair" or "bad," the more objective terms, "scratched," "worn," "dusty" and "broken" might be used. Miss Butler[62] in her Pittsburgh survey study of factory conditions uses the word "excellent" to mean not simply absence of dirt, but a manifest cleanliness, occasional lanes of sunlight through the windows, the movement of fresh air, newly whitewashed walls and ceilings, and a floor that is scrubbed as well as swept. She used the term "good" to mean not newness and freshness, but daily sweeping and freedom from accumulations of dirt. In the various ways enumerated in this paragraph it is possible for the scientific student of social conditions to arrive at a tolerable degree of objectivity in his records of observations.

[62] *Women and the Trades*, p. 107.

QUANTITATIVE EXPRESSION IN THE SCHEDULE

The objective expression of qualitative conditions which we have thus far described, although constituting an advance upon the use of qualitative terms, falls short of giving quantitative expression to the observation of social conditions. Commons[63] in his "Dwelling House Score Card," and Perry[64] in his "Measure of the Manner of Living" have suggested ingenious devices by which it is possible to record in quantitative form a student's observations of housing conditions and the standard of living.

Commons, recognizing the difficulty of agreeing upon standard units to be adopted in social investigations, found a helpful analogy in the procedure of the expert judge of live stock. Breeders' associations and produce exchanges have attained considerable success and precision in standardizing and grading agricultural products such as wheat, corn, butter, horses, cows and pigs. This has been done by the device of representing the perfect example of a product by 100 points and mapping off the description of the perfect instance by a number of specifications each of which is given a definite weight or value, corresponding to its importance in making up the perfect exam-

[63] Commons, J.—"Standardizing the Home," *Journal Home Eco.*, Feb. 1910; also *Quarterly Amer. Statistical Assoc.*, vol. 9, No. 84.

[64] Perry, C. A.—*Quarterly Pub. Amer. Statistical Assoc.*, vol. 13, No. 101.

ple. Why not apply the same principle of standardizing and grading by the use of weights to the study of social conditions, and thus secure a quantitative expression for the elusive qualitative condition? This is just what Commons and Perry have done.

If the student will now examine the "Dwelling House Score Card," shown in figure 10, he will see how such a qualitative descriptive term as location, which is so often vague in current usage, is nailed down to certain precise and objective characteristics of the concept location. This is done by breaking up the problem into its elements. For example, location is analyzed into six different elements with a possible numerical score of eighteen points if all the specifications are fulfilled in a given instance. These elements are (1) General character of the neighborhood, villa, farm, residence, park (discredit for factory, slum, neglected district),—the possible score of this element is three points; (2) Elevation—high ground sloping away on all sides,—possible score three points; (3) Condition of street—width in feet, clean, smooth, hard, free from dust, sprinkled, flushed, free from refuse (indicate whether asphalt, block, stone, macadam, cobble, wood, or dirt),—possible score three points. Elements number (4), (5) and (6) relate to smoke, odors, and dust, and are accompanied by appropriate descriptions. Each element has a possible score of three points. Continuing the analysis, congestion

[*THIRD REVISION—Please send recommendations for revision to John R. Commons, University of Wisconsin, Madison, Wisconsin.*]

DWELLING HOUSE SCORE CARD.

Applies to a single Family or Household

State..... *City*..... *Street*..... *No*.....
Name of Owner..... *Name of Occupant*.....
Name of Investigator..... *Date*.....

Instructions for Discrediting when Depending on Judgment

Deduct from possible 6: very slight, 1; slight, 2; marked, 3; very marked, 4; extreme, 5.

Deduct from possible 3: very slight, ½; slight, 1; marked, 1½; very marked, 2; extreme, 2½.

I.—DWELLING—100 POINTS.	Possible Score	Points Deficient	Actual Score
LOCATION—18 Points	(18)	( )	( )
1. General Character of Neighborhood, villa, farm, residence, park, (Discredit for factory, slum, neglected district)	3	.....	.....
2. Elevation, high ground, sloping away on all sides	3	.....	.....
3. Condition of Street, width (ft.)...., clean, smooth, hard, free from dust, sprinkled, flushed, free from refuse..... (Indicate whether asphalt, block, stone, macadam, cobble, wood, dirt)	3	.....	.....
4. Smoke, free from (indicate source).....	3	.....	.....
5. Odors, free from nauseous (indicate source)	3	.....	.....
6. Dust, free from (indicate source).....	3	.....	.....
CONGESTION OF BUILDINGS—26 Points	(26)	( )	( )
7. Character of Dwelling—10 Points (indicate character)			
Detached	10	.....	.....
Attached, separate entrance, discredit 1 point			
Attached, common entrance, discredit 2 points			
Flat (entire floor), discredit 3 points			
Apartment (2 or more on same floor), discredit 4 points			
Basement dwelling (over ½ above street level), discredit 5			
Cellar dwelling (over ½ below street level), discredit 6			
Additional discredits for flat or apartment without elevator, 2nd floor 2 points, 3rd floor 3 points, etc.			
8. Sunlight—16 Points ..			
Height and distance of next building (use foot of its own window in case of flat or apartment, otherwise foot of lower window, as base line above which to measure height of next building)			
Direction (Ind. street or alley) / Height (feet) / Distance (feet) / Per Cent. (Height=100)			
North	3	.....	.....
South	5	.....	.....
East	4	.....	.....
West	4	.....	.....
(If distance equals or exceeds height, no points deficient—if distance is less than height, actual score is same per cent. of possible score as distance to height, e. g. if distance= 20% of height, actual score=20% of possible score, etc.)			
Forward (OVER).....	44	.....	.....

I.—DWELLING—100 POINTS.	Possible Score	Points Deficient	Actual Score
Forwarded	44	.....	.....
WINDOW OPENINGS—11 Points			

Rooms (Indicate kitchen, sleeping, bath, etc.)	Window Space (Sq. Ft.)	Floor Space (Sq. Ft.)	Per Cent. Window Space (Flr. space=100)
1.....	.....	.....	.....
2.....	.....	.....	.....
3.....	.....	.....	.....
4.....	.....	.....	.....
5.....	.....	.....	.....
6.....	.....	.....	.....
7.....	.....	.....	.....
8.....	.....	.....	.....
9.....	.....	.....	.....
Number of Rooms (including dark rooms) having window space less than 20%..			
Per Cent. of same to total rooms.....			
Number of Dark Rooms.....			
Per Cent. of same to total rooms.....			

9. Total Window Space, not less than 20% of total floor space..... (Discredit ¼ point for each deficiency of 1%—e. g., window space 16% of floor space, discredit 1 point, leaving actual score 4)	5	.....	.....
Distribution of Window Space—6 Points.			
10. Deficient Rooms, no room less than 20%... (Discredit same per cent. of possible score as per cent. of rooms having window space less 20%, e. g., 6 room house, 2 rooms deficient, discredit ⅓ of 3=1, leaving actual score 2)	3	.....	.....
11. Dark Rooms, no room without window openings ..... (Discredit same per cent. of possible score as per cent. of dark rooms, e. g., 6 room house, 1 dark room, discredit ⅙ of 3=½, leaving actual score 2½) **Notice:** dark room is discredited also above as "deficient room"	3	.....	.....
Forward	55	.....	.....

I.—DWELLING—100 POINTS.	Possible Score	Points Deficient	Actual Score
Forwarded	55	.....	.....
AIR AND VENTILATION—13 Points	(13)	( )	( )
12. Heating Arrangements, adapted to secure circulation of fresh air such as open fireplace, hot air furnace, stove (connected directly with chimney in same room)... (Discredit 1 point for steam or hot water, ½ point for each stove connecting with chimney in another room)	4	.....	.....
13. Temperature, adapted to secure even temperature, not excessive heat or cold, equal in different rooms..... (Discredit proportionately for each room without heating appliance)			
14. Dampness, freedom from (indicate whether cellar, kitchen, sleeping rooms, other rooms)	6	.....	.....
STRUCTURAL CONDITION—6 Points	(6)	( )	( )
15. Material, (Indicate whether wood, brick, stone, concrete) no decayed wood, walls, floors, ceilings in good condition..... (Discredit ½ point for papered walls or ceilings)	3	.....	.....
16. Height of Ceiling, not less than 9 feet... (Discredit ¼ point for each foot deficient)	1	.....	.....
17. Floor Space, (no room less than 120 sq. ft.)	2	.....	.....
HOUSE APPURTENANCES—26 Points (Discredit total score in each case if appurtenance is not provided. "Common" signifies "used in common" by two or more families.)	(26)	( )	( )
18. Bath, (Discredit 2 points for common bath)	4	.....	.....
19. Closet in Dwelling..... (Discredit 1 point for common closet, 2 for outhouse with sewer connection, 3 without sewer)	4	.....	.....
20. Sink, (Discredit ½ for common sink)...	1	.....	.....
21. Laundry, (Discredit ½ for common laundry)	1	.....	.....
22. Running Water in house, (Discredit 1 point for common hydrant, 2 for hydrant outside, 3 for well outside).....	4	.....	.....
23. Condition of Appurtenances, good material and workmanship, all pipes exposed.	6	.....	.....
24. Quality of Water for drinking.....	3	.....	.....
25. Quality of Water for bath and laundry...	3	.....	.....
DWELLING TOTAL (Score No. 1)	100	.....	.....

B.—COST OF HOUSING

Rent per month $..... **Rental value** (if occupied by owner) $.....

Unit of Comparison	Nominal Rent	Real Rent
Rent per room.....	$.....	$.....
Rent per 100 sq. ft.....	$.....	$.....
Rent per 1,000 cu. ft.....	$.....	$.....

Probable income of family per month $.....

II.—OCCUPANTS—100 POINTS	Possible Score	Points Deficient	Actual Score
CONGESTION OF OCCUPANCY—61 Points	(61)	( )	( )
Occupants, number			
Family, 10 years old and over, male.....			
" " " " " " female.....			
Lodgers, Domestics, 10 years old and over, male			
Lodgers, Domestics, 10 years old and over, female			
Children under 10 years.....			
Total (Child under 10 as ½ person).....			
1. Cubic Air Space, (average height of ceiling by total floor space), cu. ft.....			
Cu. ft. per occupant..... No discredit if 1000 or over.....	50	.....	.....
(Discredit 1 point for each 20 ft. below 1000, e. g., 600 cu. ft. discredit 20 points, leaving actual score 30)			
2. Sleeping Rooms per occupant.....	11	.....	.....
(Discredit 1 point for each person in excess of number of sleeping rooms)			
CONDITION OF AIR AND VENTILATION—18 Points	(18)	( )	( )
3. Windows, kept open to fresh air			
Living rooms	3	.....	.....
Sleeping rooms	6	.....	.....
4. Temperature, kept even, not excessive heat or cold	3	.....	.....
5. Dust, care in avoiding dust by sweeping no home workshop	6	.....	.....
CLEANLINESS, care and attention, no rubbish, dirt, grease or refuse,—21 **Points**	(21)	( )	( )
6. Hallways	3	.....	.....
7. Floors	3	.....	.....
8. Walls	3	.....	.....
9. Plumbing ..	6	.....	.....
10. Yard	6	.....	.....
OCCUPANTS TOTAL (Score No. 2)....	100	.....	.....

Rent per occupant (nominal)..... $.....

Real rent per occupant (compared with standard) ..... $.....

Figure 10. Commons' dwelling house score card.

of buildings has a possible total score of twenty-six points. It is analyzed into its various constituent elements. The analysis follows this procedure consistently and enumerates in all twenty-five elements of the standard dwelling. The total possible score for a dwelling is thus 100 points. In proportion as dwellings fall below the standard they are graded below 100.

The advantage of this method of recording observations of social conditions is that it limits the total margin of error by breaking it up into thirty or forty little margins. When a field worker has "scored" a house according to the analysis on the card, we attain the actual score of the house compared with a perfect or ideal house. Commons takes rent "per 100 square feet" as the most satisfactory unit by which to compare the cost of housing. For example, where two houses, renting nominally at a dollar per month for equal floor space, score 80 and 50 respectively, the real rent of one is $1.25 and of the other $2 for the unit of house accommodation. Compared with this the perfect house has a real rent of $1. In order to measure the congestion of occupancy Commons uses as unit of comparison rent per occupant. Taking the same two houses which we assumed showed scores of 80 and 50 respectively on the "dwelling" card, and assuming that the occupants of each were scored alike at 70 on the "occupant" card, then 56 and 35 respectively are the combined dwelling and occupant scores. If the nominal

rent should be $2 per occupant, the real rents would then be $3.57 and $5.71 per occupant, as compared with $2 for the ideal dwelling occupied by the ideal tenant.

Perry,[65] believing that the ideal towards which American families tend is that of having separate apartments and a separate and suitable equipment for carrying on each of the fundamental household activities, has selected a standard manner of living as an arbitrary measure of different households. He enumerates fourteen characteristics in the equipment of the kitchen and assigns to each an arbitrary numerical weight. The field worker records his observation by checking the item which appears in the household visited. This method does not require any questioning on the part of the field worker and the enumeration of items to be observed restricts the visitor to decisions which allow practically no play of individual judgment, and thus safeguards the method from the vitiating effects of the personal equation. The score card appears in figure 11.

When the field worker returns to his office appropriate weights are entered in the RT. column for the items checked in the CK. The final index of a family is obtained by dividing the total ratings by the total weights. Although the system of weights is arbitrary, articles in the dining room are given twice the weight of articles either in the kitchen or bed room, and articles in the parlor

[65] *Op. cit.*

I. KITCHEN.

Articles.	CK.	WT.	RT.
Stove	.....	4	.....
Gas Stove (7)	.....	.....	.....
Table	.....	3	.....
Tin closet		3	.....
Cupboard	.....	3	.....
Cabinet (7)	.....	.....	.....
Sink	.....	4	.....
Chair	.....	1	.....
Bench (1)	.....	.....	.....
Oilcloth on floor	.....	4	.....
Window shades	.....	2	.....
Wash basin	.....	1	.....
Refrigerator (10)	.....	.....	.....
Heating plant in cellar (2)	.....	.....	.....
Total weight and rating of Kitchen	.....	25	.....

II. DINING ROOM.

Articles.	CK.	WT.	RT.
Dish closet	.....	6	.....
Table	.....	6	.....
Sideboard (10)	.....		.....
Table cover, white	.....	5	.....
Table cover of oilcloth (2)	.....	.....	.....
Table cover, colored (3)	.....	.....	.....
Carpet	.....	12	.....
Oilcloth (5)	.....	.....	.....
Rug (15)	.....	.....	.....
Window shades	.....	3	.....
Curtains (6)	.....	.....	.....
Pictures	.....	3	.....
Pictures Framed (6)	.....	.....	.....
Lamp	.....	5	.....
Seating (Rating $\frac{\text{No. of chairs}}{\text{No. of family}} \times 10$)	.....	10	.....
Sewing Machine (5)	.....	.....	.....
Cradle (5)	.....	.....	.....
Refrigerator (10)	.....	.....	.....
Total weight and rating of Dining-Room	.....	50	.....

Fig. 11. Score card for manner of living.

have three times the weight of articles in the kitchen or bed room. The rapid increase of values secured by this method gives a quantitative expression for different stages of household development. For example, there will be a clear demarcation between the household still in the kitchen stage and one that has reached the dining-room stage.

The score card method, although new in the field of social investigations, holds forth considerable promise to the scientific investigator. By this device social facts are measured by a definite standard agreed upon beforehand. The complicated problem is broken up into its most essential elements, and each element is judged separately, thus breaking up the total margin of error into thirty or forty little margins in which the errors may be reduced to a minimum. The weights assigned to items are of course arbitrary, but since the weights are constant throughout the investigation whatever error there may be is also a constant error. With added experience and investigation a less arbitrary system of weights will be devised. In any event the score card suggests an ingenious device for giving quantitative expression to the records of observations and qualitative social facts.

SUMMARY OF PRINCIPLES

To summarize now the principles that should guide in the selection of the inquiries to be printed on the schedule:[66]

(1) Inquiries should be comparatively few in number.
(2) Require an answer of a number or "yes" or "no."
(3) The recording of observations of qualitative facts should be in quantitative or other objective terms.
(4) Inquiries should be simple enough to be readily understood.
(5) Such as may be answered without bias.
(6) Not unnecessarily inquisitorial.
(7) As far as possible corroboratory.
(8) Answers suggested as alternatives, the correct one to be checked.
(9) Inquiries such as directly and unmistakably cover the point of information desired.

THE SCHEDULE AS DETERMINED BY PRACTICE IN TABULATION

Formulating inquiries for the schedule is a process somewhat more restricted than the foregoing statements would seem to indicate, because

[66] Compare, Bailey and Cummings, *Statistics*, pp. 8–11; King, W. I.—*Elements of Statistical Method*, p. 57; Secrist, H.—*Introd. Statistical Methods*, pp. 53–4.

the classification systems which have been used in the tabulations of former reports often determine quite rigidly what inquiries should be entered on the schedule.[67] In the census work of the government, the schedule used in any enumeration must produce data to make the new tabulations comparable with the old. This may also be the case in studies of income and expenditure which are carried on by private agencies. Tabulations in printed reports therefore often determine specifically the number and the nature of inquiries that shall be printed on a schedule. In a new field of investigation, however, with no former tabulations to restrict, experimentation with trial schedules is the usual procedure. It is hardly possible even after the comparative study of schedules used by other investigators to devise one in all respects satisfactory for a given study. It is a good plan to draw up trial schedules and test them out in the field before going to the expense of printing the finished schedule in large quantities.

THE QUESTIONNAIRE METHOD

In the investigation of some problems it is not possible to secure full information from field work study and the material obtained by first hand contact with the facts needs to be supplemented with information obtained in questionnaires sent to correspondents. Many of the principles which

[67] Bailey and Cummings, *op. cit.*, pp. 26–31.

determine the arrangement and selection of inquiries on a schedule apply with equal force to the questionnaire. Some of the more important of these it is worth while to repeat and to add to them the principles peculiarly applicable to the questionnaire method.[68]

(1) The questionnaire should have an air of the personal wherever possible. Therefore avoid use of the stereotyped "Dear Sir" or "Madam" and place at the head of the questionnaire the name and address of the informant. After the introductory paragraph it is desirable to write and not to print the signature of the investigator.

(2) The advantage of having the name and address of the correspondent at the beginning of the questionnaire is that some correspondents forget to enter their name and address when writing returns and this omission makes identification difficult if not impossible.

(3) Ask the question in such a way that the answer is shifted from the basis of mere accommodation to one of interest. It often helps to request the informant to indicate whether he desires a copy of the final report.

(4) Questions should be as few as possible because in most questionnaires the informant's answer is voluntary and a bulky list will appear more formidable than it really is, thus discouraging replies.

[68] Hobson, A.—"The Use of the Correspondence Method in Original Research," *Quart. Pub. Amer. Statistical Assoc.*, vol. 15, No. 114, pp. 210–218.

OCTOBER REPORT: Fill out and mail promptly to State Department of Labor, Albany, N. Y. Insert carbon for copy and retain second sheet for your files

STATE DEPARTMENT OF LABOR—THE INDUSTRIAL COMMISSION

Bureau of Statistics and Information

ALBANY, N. Y., *October* 21, 1918.

GENTLEMEN:

For the purpose of obtaining for public information monthly statistics as to fluctuations in employment, to be incorporated in the Labor Market Bulletin, this Commission respectfully requests you to submit the data for October called for below. No information of any description as to individual firms will be made public; only totals for industries and for localities will be published. This report should be submitted immediately.

Very truly yours,

(*Signed*) L. W. HATCH,
Chief Statistician.

Approved for the Commission.
LOUIS WIARD,
Commissioner.

Report on Employees and Wages

Directions. The figures must be taken from pay rolls or other records. Use that pay roll in which the 15th of October fell. Give the figures for that pay roll, whatever the period covered by it, indicating by dates in the first column the period covered.

Period of Selected Pay Roll Including 15th of October	Employees on Pay Roll			Total Wages Paid		
	Office force	Shop force	Total	Office force	Shop force	Total
October....to...., 1918..	.....	.....	.....	$....	$....	$....

Remarks. If there have been special circumstances, such as changes in wage rates, processes of manufacture or line of goods made, or such as departments or branch factories opened or closed, etc., which would affect the significance of the figures reported, kindly note the same here.

Date..... Signed (name).....

Title.....

Figure 12. Questionnaire to be sent to employer.

Charles F. Gettemy
Director

[L-35]

THE COMMONWEALTH OF MASSACHUSETTS

BUREAU OF STATISTICS

Labor Division

STATE HOUSE, BOSTON

DEAR SIR:

The Bureau requests your assistance in securing, as heretofore, quarterly statistics of employment of organized labor in the Commonwealth. The questions on the attached form refer to the organization named thereon, and information is desired for the date specified. After answering the inquiries kindly tear off the form below and return it in the enclosed envelope, within ten days if possible.

A copy of our report containing summary tables of the returns from all unions reporting and other information of interest to organized labor will be sent addressed to each correspondent furnishing the information herein requested.

Respectfully yours,
(*Signed*) CHARLES F. GETTEMY,
Director.

.....

File No. 3.

EMPLOYMENT AND MEMBERSHIP—REPORT FOR.....

Notice.—Kindly answer each question in order that further correspondence may be rendered unnecessary. If any question is not applicable to your organization, mark a cross (X) opposite such question. Where the proper answer is "NONE," this word should be written, so that we may know the question has been considered by you. Remarks with reference to any of the inquiries may be written on the reverse side of this schedule.

1. City or town where your organization is located.....

2. Name and local number of your organization.....

3. Occupation or kind of work done.....

	Men	Women
4. How many members were unemployed because of lack of work or material?.....		
5. How many members were unemployed because of unfavorable weather?		
6. How many members were unemployed because of strike or lockout?.....		
7. How many members were unemployed because of sickness, accident, or old age?.....		
8. How many members were unemployed because of other reasons?.....		
State what these other reasons were.....		
9. Total number of members unemployed on date specified above.....		

10. Total membership of your local organization on date specified above?

Men..... Women..... Total.....

Information supplied by.....
Date.....Official position.....
Address .....

Figure 13. Questionnaire sent to labor unions.

(5) Questions should be so minutely analyzed beforehand that the correspondent may answer by merely checking off the correct answer that appears as an alternative to others upon the list. It should be remembered that checking is quicker and more legible than handwriting.

(6) Questions should be arranged in the order of importance for the subject under investigation so that the correspondent will answer those that are essential even if the later ones are left unanswered.

The student should examine the questionnaires appearing in figures 9, 12 and 13 and criticize them in the light of the foregoing principles. Figure 9 presents part of a questionnaire sent out by the Children's Bureau to courts hearing children's cases. Figure 12 is a questionnaire sent out by the Industrial Commission of the New York State Department of Labor to employers to obtain information for incorporation in the Labor Market Bulletin. Finally, Figure 13 is a questionnaire sent to labor organizations to secure information on the employment of organized labor in Massachusetts.

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CHAPTER VIII

EDITING, CLASSIFICATION, TABULATION AND INTERPRETATION OF FIELD WORK DATA

When the field work phase of an investigation is complete, the student proceeds to prepare his material for statistical interpretation. The process of preparation involves editing, classification, and tabulation of the information recorded on the schedule.

Card schedules facilitate editing, classifying, and tabulating because they are readily handled. The Massachusetts State Census has for several decades used separate cards for each individual and each family enumerated. In the 1915 census the dimensions of these cards were $3\frac{7}{8} \times 6\frac{7}{8}$ inches. Blue cards were used for enumerating males, pink cards for females, yellow cards for families, and white cards for Civil War veterans. In contrast to this card schedule is the population schedule of the Federal Census, 16×23 inches in dimensions. Fifty persons are enumerated on each face, making one hundred returns for every schedule. While this large paper schedule takes up less space in bulk and weighs less than one hundred cards, it is not as easily handled in the

editing and is likely to become soiled and torn. Moreover, the complete loss of a large schedule means the loss of returns for one hundred persons. The card schedule seems on the whole the more efficient and practical form. The standard size is usually 5×8 inches.

The editing of schedules aims to secure a high degree of accuracy, consistency, uniformity, and completeness in the returns.[69]

EDITING SCHEDULES

(1) *Accuracy.* Certain replies may raise a presumption of error which justifies investigation for verification. This is often the case in returns for age. Occasionally it is possible in instances where schedules are in the form of a questionnaire filled in by a reporting agency to return them to the correspondent for correction. As a rule, however, the editor must accept as final the replies entered upon the schedule.

Bailey and Cummings say, "All schedule replies are equally original and the only evidence competent to justify the revision of one reply is the evidence presented in the other replies." In deciding upon which of two or more inconsistent replies is to be accepted as correct, the editor is guided by the general principles that a strong probability of correctness attaches to one reply. If it is clear that there is no strong probability of correctness, the inconsistent replies are put into the "no

[69] Bailey and Cummings, *op. cit.*, pp. 17–25.

report'' class. The editor is never justified in erasing returns on the schedule and any revisions that he does make should be written in a distinctive ink so that the corrections of the editor may always be distinguished.

(2) *Consistency.* There should be systematic examination of all related replies in order to check one against another. Since some inquiries are more or less related, the reply to one inquiry often enters into the determination of the reply to another — for example, date of birth and age, marital condition and age.

Occasionally totals do not check up with the number of constituent items and must be made consistent by editing. For example, a family budget is incorrectly totaled or balanced or the number of individuals returned in a given family is more or less than the total members recorded elsewhere. The return that a person was the head of a family and was employed in some gainful occupation together with other details on the schedule might in some cases justify editing an inconsistent age return as ''age unknown'' on the strong probability that an error had been made in recording the age, possibly by omitting one figure in writing the age, as in recording a person of the age 20 years as of age 2 years.

(3) *Uniformity.* It sometimes occurs that returns for the same fact are variously stated. This gives rise to the problem of uniformity. In occupational returns the same occupation may be

given different names in different localities or may be vaguely designated. Indeterminate returns such as "clerk," "engineer," "mechanic," etc. may be used. It is thus necessary to edit returns for uniformity in order that they may be consistently grouped for tabulation.

(4) *Completeness.* When replies are actually omitted they must be supplied by the editor in order to permit tabulation. Usually the entry "no report" or "unknown" will suffice where no specific reply is indicated by the other data on the schedule.

Wherever possible it is desirable to verify and check returns by clearing them through some other agency which possesses comparable data.[70] The Health Insurance Commission of Illinois checked the data secured from family investigations against records possessed by social agencies in Chicago. Since practically all of the more important social agencies of the city registered their cases either with the Social Service Registration Bureau or with the Central Bureau of the Jewish Charities, all schedules collected in the family study were cleared through these two registration bureaus. With the coöperation of the Cook County Agent the schedules were again cleared through his branch offices in order to verify the statement of the family of the fact of aid received and also to determine the exact value in money of the monthly supplies issued. Records of

[70] *Report of Health Insurance Commission*, pp. 181–3.

the different dispensaries of Chicago and of the Municipal Tuberculosis Sanitarium were also used to check the schedules. With but few exceptions reports made by the family and recorded on the schedules were confirmed by an examination of these records.

In the central office of the Massachusetts Census [71] population schedules showing omissions are checked against local assessor's lists or real estate maps which may show population and dwellings where the enumerator has returned none. There are a great variety of documentary and printed sources of social data which would be available for verification purposes if the student will only use a little ingenuity in discovering them and putting them to use. This process of checking is tedious work but time spent in this way is amply justified by the increased accuracy and completeness of the returns.

CLASSIFICATION

When the schedules have been edited to the satisfaction of the student, the next step is to transfer the information recorded thereon to tabulations or other methodical arrangements of the information. Before considering the technique of statistical tabulation it will be helpful for the moment to consider the purpose of classification of which tabulation is but a special technique.

[71] *Decennial Census of Massachusetts*, 1915, Part I, pp. 22, 24–26.

Cramer[72] says, "Performed consciously or unconsciously, the act of classification is indispensable to and accompanies every scientific inference. The mind is orderly or slovenly, according as it does or does not habitually and accurately classify the facts with which it comes in contact. The success of an investigation, the worth of a conclusion, are in direct proportion to the fidelity to this principle and the exhaustiveness with which the process is carried out."

A valid system of *classification* helps us to avoid loose habits of thinking and is a step of great importance in scientific method. In the first chapter we saw that classification, the third step of the inductive method, follows upon the collection of the material. It is a process of grouping things together according to their possession of certain selected common attributes. When we classify material we place together in classes the things that possess in common the greatest number of attributes. The usual categories of classification are those of time, place, size or magnitude, and order. It is to be noted, however, that categories of kind and type blend and overlap and are not exclusive in any absolute sense. Classification facilitates comparison. It assists us in showing sequences and series. The scientific test for classification is the number and importance of properties which can be regarded as common.

[72] Cramer, F.—*The Method of Darwin: A study in Scientific Method*, p. 88.

In approaching classification we may either decide a priori the nature of the classes, or we may examine the material to discover whether items fall into distinct groups with several common traits.

Bowley[73] finds the a priori method most appropriate for industrial data when division is made on the basis of function. Occupations give nearly clean lines of division. There is comparatively little overlapping. Consider the following scheme of classification by degrees of occupation.

CLASSIFICATION BY DEGREE OF OCCUPATION

1. Occupied in production of utilities or in rendering services for profits or wages, during normal hours.
2. Occupied in production of utilities or in rendering services for profits or wages, during part of working hours, and (a) also doing domestic work at home, or (b) completely leisured at home.
3. Completely occupied in domestic work at home.
4. Partly occupied at home and partly leisured.
5. Unoccupied, (a) below school-leaving age, (b) past work, (c) others.

ANALYSIS OF NATURE OF OCCUPATION

1. Employed.
   (a) Whenever occupied for gain and
      (i.) not employing others,
      (ii.) employing others.
   (b) In part of occupations for gain and
      (i.) not employing others,
      (ii.) employing others.
2. Employers and direct workers.
   (a) Directing, not making.

[73] Bowley, *The Measurement of Social Phenomena*, pp. 54–58.

(i.) At will, for client.
(ii.) Under general instructions.
(b) Directing and making.
(i.) At will, for client.
(ii.) Under general instructions.
(c) Making without help.
(i.) At will, for client.
(ii.) Under general instructions.

ANALYSIS OF CONDITION OF EMPLOYMENT

1. Directing.
2. Under orders, (a) Clerical, (b) Manual, subdivided by degree of skill and responsibility.

Cross-division, (a) Learners, (b) With completed knowledge.

CLASSIFICATION IN RELATION TO DEPENDENCE

1. Dependent, (a) entirely, (b) contributing part of cost of keep, (c) contributing special cost.
2. Independent, (a) contributing special and general cost, (b) not living in family.
3. With dependents.

Statisticians have found that the clearest lines of demarcation between occupations are those which separate the materials which are handled in manufacture (as metals, wood, clay, and animal products, etc.). In the practical application, however, there are so many difficulties in classification by occupation and employment that it is futile to attempt universal definitions. *The best procedure is to take industry by industry and to classify the various occupations on broad divisions which allow a margin of uncertainty.*

In classification by social position the diffi-

culty of discovering clean lines of separation is greatest. Occupation, income, and habits are determining elements in the distinctions made between social classes. Often a grading by income nearly corresponds to the test of social intercourse. In the manual laboring class the criteria are those of habits and customs quite as much as income or occupation. The amount of income or expenditure by individuals or families has an order that frequently corresponds to the social grading. When modes are found at different points in the income scale of a considerable aggregate of people, these modes often point to the existence of a type, but the problem is more complicated than this. Agricultural laborers may receive the free use of a cottage in addition to a wage. How is the cottage to be rated with reference to income? Again, the total income of some artisans is equivalent to or actually larger than that of some teachers, yet each class buys different goods and has different habits. Before the factory system had been so generally adopted in manufacturing as it is today, there were two modes in the wage series of manual workers, indicating respectively unskilled and skilled artisans. These groupings have been obliterated by machine industry.

One of the most satisfactory methods of classifying social and psychological data is to enumerate them in the order of frequency. Healy [74]

[74] *The Individual Delinquent*, pp. 130–131.

has used this method to advantage in his study of delinquent careers. The following table illustrates the device of classifying by order.

SUMMARY OF CAUSATIVE FACTORS BY GROUPS AND TOTALS IN 823 CASES: 560 MALES, 263 FEMALES.

Groups of Causative Factors	Number of times appeared to be main factor	Number of times appeared to be minor factor	Total Number of times appeared as factor
Mental abnormalities and peculiarities	455	135	590
Defective home conditions, including alcoholism	162	394	556
Mental conflict	58	15	73
Improper sex experiences and habits	46	146	192
Bad companions	44	235	279
Abnormal physical conditions, including excessive development	40	233	273
Defects of heredity	.....	502	502
Defective or unsatisfied interests, including misuse or nonuse of special abilities	16	93	109
Defective early developmental conditions	.....	214	214
Mental shock	.....	3	3
Deliberate choice	1	.....	1
Sold by parent	1	.....	1
Use of stimulants or narcotics	.....	92	92
Experiences under legal detention	.....	15	15
Educational defects extreme	.....	20	20
Totals	823	2,097	2,920

Although it is frequently difficult to discover many common attributes of social data to use as the basis of classification, statisticians and scientific students of social problems have developed a few reliable systems of classification in special fields. The International List of Causes of Sickness and Death is a valid classification system for material consisting of statements of causes of death. The United States Census Bureau has prepared in its publication, "An Index to Occupations," a classification of 215 main occupations and occupation groups, 84 of which are sub-

divided, making a total of 428 separate occupations and occupation groups. The International Association of Industrial Accident Boards and the Bureau of Labor Statistics have evolved a system for the classification of accidents. Davenport[75] in his "Trait Book" has worked out a classification of physical and mental traits to be utilized in the study of human heredity.

Scientific progress in social investigation requires willingness on the part of students to utilize such standard classification systems as those described. It is indifference to the use of such standard classification systems that renders much of our social and medical material useless. The standard classification systems are generally accepted among scientific men because the terms and distinctions used in such system are objective and of very wide applicability. Psychologists were once given to the construction of subjective systems of classification but they have now passed beyond that stage. Unfortunately however, some sociologists are still given to the promulgation of fantastic systems of classification that have not the slightest claim to universal validity.

TRANSCRIBING

The system of classification to be used in the given study having been decided upon, the investigator now considers the problems of transferring his data from the schedules to tabular forms. In

[75] *The Trait Book*, Eugenics Record Office Bulletin, No. 6, 1912.

ordinary investigations made by small private agencies in one-time studies like social surveys which are not to be repeated, the data are usually transferred by hand. Items should be taken off systematically, according to a prepared scheme of tabulation so that by taking off several factors in combination time may be economized in one handling of the schedule. Whenever possible it is desirable to avoid going over schedules several times to compare related facts. Such related facts as cause of sickness, age, and sex might be taken off on a trial tabulation with the list of causes of death written in a verticle column and a stub with ages written in the box captions horizontally across the top, and sex differences indicated under the appropriate captions and opposite the appropriate stub designation, in red for females and blue for males.

Compilation for sub-totals is facilitated by counting in fives or tens, making four short vertical marks to represent four items and an oblique mark crossing them for the 5th., thus ||||. Four dots may be made in a row and a line drawn through for the 5th. case, thus $\dot{\cdot}\dot{\cdot}$. When this process is ended addition may be completed by counting five at a time and entering the resulting totals in distinctive ink or pencil.

In investigations of considerable size where great numbers of schedules involving hundreds of thousands and millions of items are concerned, the data are transferred from the schedules to

punched cards by means of special machinery. This method is followed in government census work and in the statistical departments of large corporations. The punched card (see figure 14) mediates between the schedule and the primary table. The data which appear on the schedules and which it is proposed to tabulate are transferred to a specially prepared card called a "punch card" by means of perforations made by the "punch machine." The punched cards are then subjected to verification by means of a "verifying machine" and finally run through the "counter and sorter," a machine which automatically sorts the cards and segregates them in accordance with the various classes of related facts to be tabulated. This process greatly simplifies the final preparation of the tables and makes it easily possible to secure many correlations of data which are not feasible under the old hand methods, except at great expense. This machinery for card punching, verification, counting, and sorting may be operated by electric power. With this equipment it has been possible to punch eleven cards a minute or six hundred and fifty three cards an hour with an error of less than one per one hundred cards. Figure 14 illustrates the punch cards and the machinery.

TABULATION

We have already considered the extent to which the system of tabulation used in reports influences

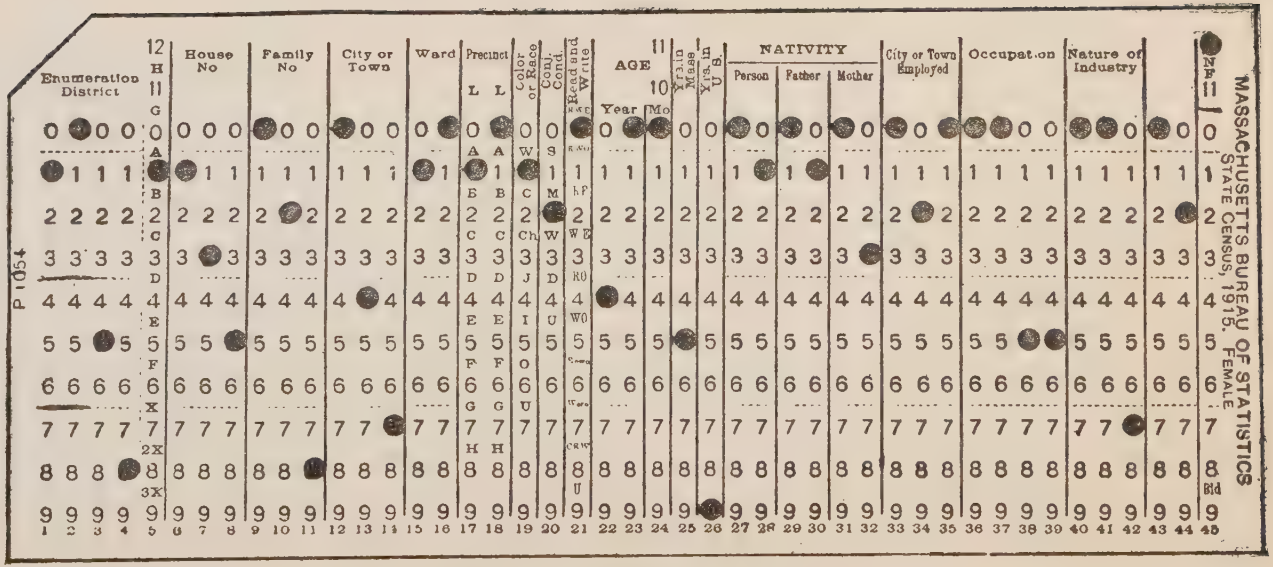

Figure 14. Census punch card.

the structure of the schedule and the type of inquiry. We must now consider the technique of tabulation itself. Tabulation is a special form in which to present a classification of social mass phenomena. It is important when determining the scheme of classes to be used in the tabulation to select distinctions that are socially significant. A purely mechanical tabulation by equal age periods would not be socially significant for such important lines of division as the age of legal majority, militia age, the child bearing age, the age of compulsory school attendance, and age limits specified in child labor laws. It is therefore important to keep the mechanics of tabulation from intruding unduly upon the data. It is of fundamental importance also to arrange data so that they are comparable with previous classifications. This principle if often violated in practice and whenever neglected reduces the value of material by sacrificing comparability of data.

While it is desirable to avoid too detailed tabulation of data, it is important to represent fairly the significance of the data by the detail of tabulation. It is unfortunate to impose a significance not inherent in the data by a classification that goes into exaggerated detail.

In general, it is helpful to make a distinction between two types of tabulation: First the *primary* or *general purpose table;* and second, the *secondary* or *special purpose table.* The former is but one step removed from the original entries on

the schedules and is designed to bring together in the most convenient and accessible form all the data bearing upon a given study.

In the construction of primary or general purpose tables the statistician is under pressure to include within his tabulation all of the data and yet to restrict the table to the capacity of the page. It is important to determine whether the given arrays of data can be best exhibited in columns or in rows. Such an extraneous fact as the vertical and horizontal capacity of the page is often the determining factor in reaching a decision. It is perfectly obvious that the maximum number of lines or rows is several times greater than the maximum number of columns since the traditional form of the printed page is an oblong. It is usually the case therefore that arrays that have the greatest number of items are assigned to columns and other arrays to rows. The student should compare the following tabular presentations of home conditions of wage earning women shown in figures 15 and 16. Considering subcaptions, the subordinate categories under the main heading "Position in the Family," are six in number in figure 15, as compared with the four sub-captions under the general heading "Conjugal Condition," in figure 16. The capacity of the page would suggest that the main heading Conjugal Condition appear in the caption or horizontal and that the various categories under Position in the Family be put in the stub.

Conjugal Condition	Position in the Family											
	Heads of Families		Living with Father 2		Living with Mother		Living with Other Relatives 3		Boarding 4		Totals	
	No.	P.Ct.	No.	P.Ct.	No.	P.Ct.	No.	P.Ct.	No.	P.Ct	No.	P.Ct.
Single	31,625	3.4	294,571	32.0	131,007	14.4	86,113	8.9	134,405	14.7	667,772	73.4
Married	15,712	1.6	5,513	.6	3,535	.3	57,935	6.2	14,752	1.6	97,477	10.3
Widowed and Divorced	83,387	9.0	4,841	.5	5,456	.6	11,939	2.08	22,873	2.4	129,496	14.5
Totals	130,725	14.4	304,955	33.2	139,998	15.4	155,987	17.2	173,020	19.0	904,695	100

1 *Statistics of Women at Work*, 1900, p. 27 (female breadwinners sixteen years of age and over in 27 selected cities 1900).
2 Breadwinners living with both father and mother are included among those "living with father."
3 Breadwinners living with husbands are included among those "living with other relatives."
4 Breadwinners living with employers are included among those "boarding." In order that percentages may be comparable they are all of the total 904,695.

Figure 15. Tabulation. Arrangement A.

HOME CONDITIONS OF WAGE EARNING WOMEN

Position in the Family	Conjugal Condition							
	Total		Single		Married		Widowed and Divorced	
	No.	P. Ct.	No.	P.Ct.	No.	P. Ct.	No.	P. Ct.
Total	904,695	100	677,772	73.4	97,477	10.3	129,496	14.5
Heads of Families	130,725	14.4	31,626	3.4	15,712	1.6	83,387	9.02
Living with Father	304,955	33.2	294,571	32.0	5,543	.61	4,841	.53
Living with Mother	139,998	15.4	131,007	14.4	3,535	.32	5,456	.60
Living with other Relatives	155,987	17.2	86,113	8.9	57,935	6.2	11,939	2.08
Boarding	173,020	19.0	134,405	14.7	14,752	1.6	22,873	2.41

Figure 16. Tabulation. Arrangement B.

As we have already indicated, the *stub* of a statistical table is the vertical series of terms of classification that appear in the left-hand column. Reading as it is customary to do from left to right, one is able to follow the numerical variations of the items through the sequence of categories appearing at the heads of the columns. These latter are called *captions* and appear in box headings of columns which follow the stub from left to right. Stubs and captions are divided into subordinate headings. The caption arrangement may be single, double, triple, or quadruple. As a rule it is unwise to go beyond a triple caption, such as appears in the accompanying tables.

When the sub-classes in captions or stubs are multiplied more than three-fold the table is given a very complicated appearance. Since one of the important advantages of tabulation is the assistance it renders in visualizing a group of relations, one of the chief advantages of tabulation is sacrificed by making the stub and caption categories complex.

The *order* of *columns* and of *rows* in the primary or general purpose table may follow almost any systematic plan. Categories of chronological or geographical order are most frequently used. Alphabetical order and order according to the magnitude of items are sometimes adopted. In general "that order should be employed which keeps the details of the table most generally accessible." [76]

It seems to be generally true that the *comparison* of like items in the column is much easier than of like items in a row. The reason is that when the eye ranges down a column of figures, variations between items are thrown into relief since the digits appear directly below one another, in the formal order of placement units, tens, hundreds, thousands, etc. We often find chronological, geographical, and quantitative classifications in the stub and qualitative classifications in the caption. But as Day says, "The important principle is to

[76] Day, E. E.—"Standardization of the Construction of Statistical Tables," *Quarterly Pub. Amer. Statistical Assoc.*, vol. 17, No. 129, Mar. 1920, pp. 59–66.

use the column position to promote the more significant comparison."

Since the eye has been trained to read from left to right and from top to bottom the most conspicuous positions in a statistical table are at the top and the left. This is true in spite of the fact that totals are customarily printed at the right and the bottom. These fundamental *reading habits* of the eye are sufficient warrant for placing *totals* at the top and the left when they are clearly the most important items of the tabulation. This procedure is particularly useful when we desire to display the whole in relation to some of its parts. On the other hand, since it is customary to print totals at the right and the bottom, we ordinarily expect to find them there. Whenever the reverse of this procedure gives serious offense to the users of the table, it is best to print totals in the customary way. Whenever the chief interest attaches to the relation of parts to the whole, the total should follow the parts and appear in the customary fashion at the right of the row and at the bottom of the column. In such cases the total may be made conspicuous by heavy type or double underlining. Ordinary reading habits make it customary to put the latest date at the extreme right of the rows or at the foot of the columns. Wherever the latest date is the figure of most importance, this customary sequence may be reversed and columns and rows begun with recent dates, working down to earlier dates. This of

course does violence to the customary arrangement in sequence and where it would confuse and offend the users of the table should be avoided. Since the rule of reading from left to right and from top to bottom is already thoroughly incorporated in graphic practices, it seems desirable in tabulation to adopt a similar rule rather than to proceed upon the opposite plan.

Rounding and abbreviating numbers is a practice that should seldom be adopted in primary tables, although this method may be used in derivative tables. While it is a good principle to avoid rounding absolute numbers, it is quite permissible to do so in the case of ratios. Ratios may be carried out to two decimal places since the first place is usually the only one of significance and the second place serves rather to qualify the first. According to the emphasis of the analysis, percentage figures should be placed next to the corresponding absolute figures or in a separate portion of the table.

The *structure* of the table should be adapted to bring out the significance of the data without doing violence to the established practices in tabulation. The *rulings* and *spacings* for major and minor headings require different treatment. Accordingly as major and minor headings are used the amount of space should be varied; subsidiary parts should be given less space and less prominence than immediate superior parts. No individual item in the body of the table should

occupy as much space as the most subordinate heading. It is customary to set off all forms by double *lines* at the top and bottom. The sides of the table should remain open as they appear in the printed page. Completely boxed in tables should be used only for small size tabulations surrounded by the printed text. As a rule major totals are set off by double lines, both horizontally and vertically. In other cases only single lines should be used. In extensive tabulations such as primary tables it is often advantageous to number the columns and rows. By these devices the detail is broken up and the monotony of an elaborate table relieved, thus making it easier to follow.

Care should be taken that items and especially totals are accurate. It is always necessary to cross-check totals.

The selection of a satisfactory *title* for the table is important. Misleading titles should be avoided. *The title of a statistical*[77] *table should be a brief epitome of its contents.* In secondary tables it is important to indicate clearly the sources of data. In addition to the usual reference to title of book, volume, page, etc., citation of the table column and line numbers should be given wherever possible. Since in many statistical tables there is a certain amount of data which it is not possible to classify under the accepted

[77] Secrist, *op. cit.*, Chapter V, "Classification-Tabular Presentation."

categories, it is often necessary to provide a supplementary column or row with the heading "miscellaneous," "not stated," "unclassified," "all other," or "unknown." Explanatory notes should always be given in order that the person who uses the table may clearly understand its limitations. Such qualifying statements should be placed in a sufficiently conspicuous position so that they may not be overlooked by the average reader.

Although most statistical tables read from left to right and from top to bottom, there is a special form known as the correlation table which reads diagonally. This table shows the frequency of items classified by groups in two associated categories.

In the construction of a *frequency table* such as the following shown in figure 17 it is important to conform to certain standard rules of practice. In the first place it is important that the data be grouped in classes of uniformly equal range; second, that the upper and the lower limit of each class be precisely defined; and third, that there be no classes with the upper or lower limit left open, such as above $16, below $5. Tables in figures 17 and 18 should be compared in this respect. The significance of conforming to these rules will be clear when we come to consider the application to the data contained in them of refined methods of interpretation. It is not possible for example to

use simple algebraic formulæ for the computation of certain important statistical indexes, when these simple rules have been violated in the construction of a given table.

FREQUENCY TABLE. ARRANGEMENT A.

Units or Amounts	Frequencies
Total	434
Under $5.00	3
$ 5.00 to $ 6.00	12
6.00 to 7.00	40
7.00 to 8.00	66
8.00 to 9.00	91
9.00 to 10.00	113
10.00 to 11.00	49
11.00 to 12.00	30
12.00 to 13.00	27
13.00 to 14.00	1
14.00 to 16.00	1
Over $16.00	1

Figure 17. Frequency table, incorrect arrangement, because class intervals not of uniform range, class limits not precise, and lower and upper limits left open.

FREQUENCY TABLE. ARRANGEMENT B.

Units or Amounts	Frequencies
Total	430
$ 5.00 to $ 5.99	12
6.00 to 6.99	40
7.00 to 7.99	66
8.00 to 8.99	91
9.00 to 9.99	113
10.00 to 10.99	49
11.00 to 11.99	30
12.00 to 12.99	27
13.00 to 13.99	1
14.00 to 14.99	1

Figure 18. Frequency table in correct form.

We may summarize briefly the advantages of tabular presentation. The statistical table substitutes method and orderliness of arrangement for irregular material. It assists the student to visualize a group of relations. The result is that the memory is less severely taxed. Data of like character are most readily compared by the use of tabular arrangement. The summation of the items of an aggregate is facilitated by the means of lines and columns in a table. Tabular arrangement also reduces to a minimum the monotonous repetition of explanatory phrases and headings.

We have now concluded our treatment of the classification of data recorded on schedules. Systematic field work provides social science with the technique necessary to collect and record the observations of social facts. Statistical tabulation supplies the social scientist with an efficient tool for the classification of his data in a way that minimizes the personal equation of the investigator. It remains to consider the fourth step of the inductive method, namely the interpretation of material classified in systematic fashion in order to discover an inductive generalization. But the method and technique of interpreting the observations of social facts so that valid generalizations may be drawn from them is beyond the scope of this book. Many valuable and careful works on the statistical method are available to the student, and in these books he will find an adequate treatment of the third great method of social research,

namely the *statistical method.* Below, the student will find a selected list of books on the various divisions of the statistical method.

SELECTED REFERENCES ON STATISTICS

Bailey, W. B., and Cummings, J.—*Statistics.* (brief handbook)

Boas, F.—*Measurement of Variable Quantities.* (algebraic theory of statistics)

Bowley, A. L.—*An Elementary Manual of Statistics.* (elementary methods applied to English data)

Bowley, A. L.—*Elements of Statistics.* (more advanced treatment of methods)

Brinton, W. C.—*Graphic Methods of Presenting Facts.* (standard book on making charts, diagrams, maps, graphs, etc. elementary and practical)

Davenport, C. B.—*Manual of Statistical Methods.* (mathematical theory of statistics applied to biometric data)

Elderton, W. P. and E. M.—*Primer of Statistics.* (excellent elementary treatment of theory)

Haskell, A. C.—*How to Make and Use Graphic Charts.*

King, W. I.—*Elements of Statistical Method.* (most practical text and manual of elementary methods)

Mayo-Smith, R.—*Statistics and Economics.*

Mayo-Smith, R.—*Statistics and Sociology.* (descriptive treatment with reference to method)

Mitchell, W. C.—*Business Cycles.* (pp. 112–139 discusses the representative character of index numbers)

Mitchell, W. C.—*Index Numbers of Wholesale Prices in the United States and Foreign Countries.* Bulletin, Whole No. 173, July 1915 of U. S. Bureau of Labor Statistics. (the standard and authoritative reference on the construction and use of index numbers)

Moore, H. L.—*Laws of Wages.*

Moore, H. L.—*Economic Cycles.* (brilliant studies of economic law using the tool of mathematical statistics)

Newsholme, A.—*The Elements of Vital Statistics.* (standard and authoritative reference)

Secrist, H.—*An Introduction to Statistical Methods.* (many examples of practical applications of elementary methods)

Secrist, H.—*Statistics in Business.*

Thorndike, E. L.—*An Introduction to the Theory of Mental and Social Measurements.* (algebraic methods applied to psychological data)

West, C. H.—*Introduction to Mathematical Statistics.* (convenient statement of method)

Whipple, G.—*Manual of Mental and Physical Tests.* (methods applied to psychological data)

Yule, G. U.—*An Introduction to the Theory of Statistics.* (standard reference work on mathematical theory)

Zizek, F.—*Statistical Averages.* (philosophical treatment of methods)

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